BUREAU OF HYGIENE AND TROPICAL DISEASES

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HELMINTHIASIS.

McCoy (O. R.). **The Physiology of the Helminth Parasites.**—*Physiol. Rev.* 1935. Apr. Vol. 15. No. 2. pp. 221–240. [70 refs.]

A very valuable summary of work and opinion on this subject. It is probable that no abstract could deal properly with it. This does not.

Respiration and metabolism.—Taking samples of the 3 main groups of parasitic helminths, *Fasciola hepatica* for Trematoda, *Moniezia expansa* for Cestoda and "*Ascaris suum*" for Nematoda, the general facts are the same. In anaerobic conditions glycogen becomes less in the worm, and carbon dioxide and fatty acids become present in the outside medium. In aerobic conditions the absorption of oxygen is in direct proportion to the oxygen tension of the medium and the amount of carbon dioxide given off is not in proportion to this absorption. The conclusion is that the metabolism is non-aerobic and consists of fermentation of glycogen into carbon dioxide and fatty acids. The objection that this change is really due to bacteria is answered by the fact that succinic acid is present equally round Moniezia and in hydatid fluid, and that while the acids present round the same parasite are always the same, those present round different parasites are different.

Nutrition.—The food in general is of easily absorbed substances in the intestine or tissues of the host. Some worms seem to produce outside themselves digestion of the host's tissues which they then take into themselves.

Growth.—This is dependent on factors in the host of which there is little knowledge, except that there is variation within the species and in addition within the individual. Its amount is reasonably well marked out by a logistic curve which is the same for different stages of the same worm when the conditions are normal for that stage—for example for the larval stage of the dog hookworm outside the body at 24·5°C. and for the parasitic stage at 37·5°C.

Reproduction.—The great capacity for this is a measure of the great risks which overtake an individual in its passage from egg to worm. It is greatest in those hosts which are not "immune" but there is no knowledge of the method of working of this mechanism.

Secretions.—Anti-enzymes are present and seem to have an important part in keeping worms from being digested, so long as they are living. Anticoagulins are a property chiefly of bloodsuckers, haemolysins of

the tissues of parasites and not of secretions, histiolysins of extra-parasitic digestion or of stages which are in fact those in which entry is gained into a host. Of exotoxins there is no evidence, of endotoxins some in infection with *W. bancrofti.*

Tropism.—McCoy quotes LANE's belief [this *Bulletin*, Vol. 28, p. 228] that thigmotaxis is the only tropism of hookworm larvae [but in justice to the memory of Professor FÜLLEBORN the reviewer has to point out his own later decision that they have a thermotaxis (this *Bulletin*, 1933, Vol. 30, p. 687)]. *Clayton Lane.*

JOYEUX (C.) & BAER (J. G.). Les hôtes d'attente dans le cycle évolutif des helminthes. [**"Waiting Hosts" in the Developmental Cycle of Helminths.**]—*Biol. Méd.* 1934. Vol. 24. No. 9. pp. 1–25. With 6 figs. [28 refs.] [Summarized in *Vet. Bull.* 1935. Sept. Vol. 5. No. 9. p. 563.]

"The authors here bring together an interesting collection of facts concerning the life-histories of nematodes, cestodes, trematodes and acanthocephalids, exemplifying the use which these parasites often make of a third host occurring between the intermediate host and the definitive host; to this third host the authors give the name "waiting host." The waiting host often serves only to collect larvae which are already sufficiently mature to take up their existence in the definitive host, but in other instances the larva which is not yet sufficiently mature passes through a slight change, which renders it infective for the final host. The waiting host usually plays an important part in collecting larvae to ensure the continuation of the species by bringing about a reasonably heavy infection of the final host, but many of them re-encapsulate in creatures which are not eaten by the definitive host and so never attain maturity. In studying the life-history of parasitic worms, and encountering accidental larval forms in hosts which would not acquire them in the normal course of events, it is unsafe to assume that the intermediate host has been found."

SCHWENCK (J.). Tropismos e tactismos. [**Tropisms including Thigmotropism.**]—*Ann. Paulist. Med. e Cirurg.* 1935. Sept. Vol. 30. No. 3. pp. 213–227.

A disquisition on tropisms in general but treating mainly of thigmotropisms and taking into account not only helminths but also insects. No original experimental work is recorded. *H. H. S.*

TAYLOR (E. L.). **Some Fallacies in the Diagnosis of Helminthic Disease.**—*Proc. Roy. Soc. Med.* 1935. June. Vol. 28. No. 8. pp. 1002–1004 (Sect. Comparative Med., pp. 44–46).

The author's last paragraph is in these words :—

"The problem before the medical or veterinary diagnostician is to determine the presence of disease—not merely the presence of parasitism. In many instances the determination of the nature of a disease caused by parasitic worms and how it may be diagnosed (the number of worms required to cause it) is still a research problem, but adherence to the medical or veterinary approach to the subject rather than to the more specifically biological one—i.e. from the angle of disease rather than from the angle of the parasite—should help to avoid such fallacies as these."

C. L.

ESPIÉ (A.). Parasitisme intestinal infantile en Tunisie. 5e région. [**Intestinal Parasites in Children in Tunis.**]—*Arch. Inst. Pasteur de Tunis.* 1935. Apr. Vol. 24. No. 2. pp. 368–370.

The first systematic study, it is claimed, of intestinal parasitism in Tunis.

The place is Ben Gardane, 100 school children had a faecal examination. Apart from *E. coli* 50 were infected, namely with ascaris 35, with trichuris 17, with *H. nana* 8, with hookworms 4. If *E. coli* is included 69 were infected. Tables give the numbers who have infection with 1, 2 and 3 kinds of parasite, with and without cysts. *C. L.*

TAO (C. S.), YU (T. H.), CHU (P. J.) & WANG (C.). **Study on the Prevalence of Intestinal Parasitic Infection among School Pupils in Shanghai.**—*Chinese Med. Jl.* 1935. June. Vol. 49. No. 6. pp. 570–576. With 1 chart. [13 refs.]

An investigation, of the faeces of 1,412 children in the Wanchu primary school, Westgate, in the City of Shanghai.

Faeces, 1 gm., was thoroughly stirred with 25 per cent. antiformin solution, put through a filter of thin gauze, centrifuged, fluid decanted, sediment stirred with hydrochloric acid and ether, again centrifuged and decanted, one drop of the precipitate put on a slide when the writer "counted and recorded the number of eggs." The number of eggs is however not mentioned; the percentage of infections are these: all infections 48·4, ascaris 35·9, trichuris 22·8, fasciolopsis 1·6, hookworm 0·6, clonorchis 0·3. The children appear to have been of the middle class. *C. L.*

OHASHI (Kenji). **The Results obtained in Hyogo Prefecture by the Use of Improved Privies of the Home Office Design on the Prevention of Parasite Diseases.**—*Jl. Public Health Assoc. Japan.* 1935. June. Vol. 11. No. 6. pp. 1–4.

Judging by drawings in the Japanese text the privy was that described by TAKANO [this *Bulletin*, 1928, Vol. 25, p. 938] with 2 upright and 2 hanging baffles. The results of examinations of privies and persons using them in 2 villages, where they seem to have been put up in all the houses, are given.

Treatments were given during the period of observation at least in Yoshiiri village. In it the percentages of infected persons in 1929 and 1934 were: for ascaris 27·2 and 20·5, for hookworms 23·3 and 1·7, for trichostrongylus 7·3 and 0, for metagonimus 1·5 and 0, for trichuris 68·4 and 35·7. In Yamada village the figures were: for ascaris 63·4 and 52·6, for hookworms 6·6 and 0, for trichuris 63 and 50·8. As to the privies in Yamada those containing live eggs were 17·4 per cent. in 1930 and 9·1 in 1924 [? 1934]; the figures for Yoshiiri are not understandable. *C. L.*

KOURI (Pedro) & DEL FRADE (Alejandro). La clonorchiasis en la ciudad de la Habana. [**Clonorchiasis in Havana.**]—*Rev. Parasit., Clin. y Lab.* Habana. 1935. Sept.–Oct. Vol. 1. No. 1. pp. 37–52. With 4 figs. English summary.

There is at present no danger of the spread of clonorchiasis in Cuba because the intermediate host is absent. The authors examined

100 Chinese, all immigrants from Canton, who complained of vague hepatic and intestinal symptoms, and found 49 of them to be passing ova of *Clonorchis sinensis*. This number was found positive by direct examination of the faeces; the actual number was probably greater. In 3 out of 6 autopsies the worm was seen in the bile ducts.

H. H. S.

UYENO (Hiroshi). Ueber den Zucker-, Fettstoffwechsel und die passive Anaphylaxie bei experimenteller Kaninchenclonorchiasis sinensis. (3. Mitteilung.) Der Anaphylaxieversuch bei Kaninchenclonorchiasis.—*Okayama-Igakkai-Zasshi* (*Mitt. d. Med. Gesellsch. z. Okayama*). 1935. May. Vol. 47. No. 5. [In Japanese pp. 1161–1172. With 3 charts. [34 refs.] German summary pp. 1160–1161.]

KOURI (Pedro), BASNUEVO (Jose G.), ALVARE (Leopoldo) & LESCANO (O.). Tecnica para el estudio de la anatomia de la *Fasciola hepatica*. [**Technique for Study of the Anatomy of** *F. hepatica*.]—*Rev. Parasit., Clin. y Lab.* Habana. 1935. Nov.–Dec. Vol. 1. No. 2. pp. 191–195. With 3 figs.

The anatomical structure of *F. hepatica* is easily made out with a lens or even with the unaided eye when the worm is freshly removed from the liver, but preservation usually soon obscures the details. The authors have found the following procedure successful:—

The worm is placed between two glass slides and gently compressed by tying the slides together with cotton; it is left for 12 hours in "10 per cent. formol." At the end of that time one slide is carefully raised (keeping it under water) and then the preparation is allowed to stay for another 12 hours, after which it is washed for several minutes in running water.

For staining Mayer's acid haemalum or Hansen's haematoxylin is recommended. The fluke is placed in a vessel containing the stain, and, after 3–5 minutes, is washed in running water or water made faintly alkaline with potash alum, or sodium or lithium carbonate. The haematoxylin stains more rapidly and if too deeply differentiation with 1 per cent. acid alcohol (HCl) should be carried out. Dehydration by graded alcohols and clearing by xylol or carbol-xylol and mounting in balsam follow in the usual way. The superposition of a 20 gm. weight on the glass for several days to keep the preparation flat is recommended, care being taken not to tilt the specimen whereby the canada balsam might run out and the specimen become dry.

H. H. S.

KOURI (Pedro). Tecnica para el examen de la bilis, obtenida por intubacion duodenal, en el diagnostico de certeza y en el control terapeutico de la fasciolosis hepatica. [**Examination for** *Fasciola hepatica* **by Duodenal Sound.**]—*Rev. Parasit., Clin. y Lab.* Habana. 1935. Sept.–Oct. Vol. 1. No. 1. pp. 53–67. With 9 figs.

In this article Professor Kouri describes in detail his technique for examining specimens of bile obtained by means of the duodenal sound to confirm a diagnosis of infestation by *Fasciola hepatica*. It is abundantly illustrated, even to the extent of depicting a microscope

and an observer searching for ova and an indication that the coarse adjustment is even better than the fine for this purpose. For actual details of the technique the original must be consulted. *H. H. S.*

KOURI (Pedro) & VALVERDE (Armando). Nuevo caso cubano de Fasciolosis hepática humana. Curación por la emetina. Estado actual de la emetinoterapia en esta parasitosis. [*Fasciola hepatica* **Infestation in Man cured by Emetine.**]—*Rev. Parasit., Clin. y Lab.* Habana. 1935. Sept.–Oct. Vol. 1. No. 1. pp. 1–15. [19 refs.]

A Cuban, 30 years of age, had a series of epileptiform attacks in the early morning. Examination of stools revealed ova of *F. hepatica* and confirmation was obtained by duodenal sound. He was treated by emetine hydrochloride intramuscularly and recovered : *i.e.*, during two months observation and examination of faeces after cessation of treatment no ova were discovered. Altogether he was given 46 cgm. of the drug. The plan of treatment was 2 cgm. on alternate days for three doses ; then an interval of a month. Ova were fewer and degenerated for a time but then reappeared and four doses each of 4 cgm. were given on alternate days. Nine days after the last of these, three more doses were given, each of 4 cgm. A fourth series of 3 doses of 4 cgm. on three consecutive days was given 6 days after the termination of the third series ; this was given " owing to the impatience of the patient," the author did not think it was needed.

The method recommended by the author is to give altogether 3 mgm. of the emetine per kilo body weight, *i.e.* 210 mgm. for a man of 70 kilos, in doses of 6, 5, 5, 5 cgm. on successive days, with daily examination of faeces and intubation (duodenal sound) once or twice. If ova continue to be present in faeces or bile after an interval of some days 4 cgm. more should be injected and further examinations made for ova. Patients have been followed up for as long as four years and have remained cured. *H. H. S.*

KOURI (Pedro) & VALVERDE (Armando). Nuevo caso cubano de fasciolosis hepática humana. Curación por la emetina.—Estado actual de la emetinoterapia en esta parasitosis. [*Fasciola hepatica* **in Man. Treatment by Emetine.**]—*Medicina Países Cálidos.* Madrid. 1935. Oct. Vol. 8. No. 10. pp. 457–468. [19 refs.] French summary (4 lines).

The authors describe another case of infestation by *F. hepatica* in Cuba.

A man of 30 years suffered from a fit of an epileptiform character. No reason was discovered for this, but faecal examination revealed ova of Trichuris. Three years later he had a similar attack and these ova were again found. Six months later, after a third fit, ova of *F. hepatica* were seen in the faeces and a duodenal sound was passed and in the bile they were present in large numbers. Treatment with emetine was continued at intervals over a period of 2 months. The ova gradually disappeared, first from the stools and later from the bile, the patient gained weight, and regained energy and there has been so far [barely 3 months] no return of the fits nor of the dyspeptic symptoms of which he formerly complained. The total amount of emetine hydrochloride injected was 46 cgm. which was 6·4 mgm. per kilo body weight. *H. H. S.*

GABRIELJAN (M. J.). Komplikationen bei der Emetintherapie von seiten des Nervensystems. [**Nervous Complications in Treatment by Emetine.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1935. July. Vol. 39. No. 7. pp. 287–291.

Eight cases were given emetine injections up to 60 in number with appearance of nervous symptoms, 5 of them had infection with *Fasciola hepatica.* The author seems to have little interest in its effect on the worms. *C. L.*

JEREMY (R.) & JONES (E. B.). **Report of a Patient with Hepatic Distomiasis.**—*Med. Jl. Australia.* 1935. Sept. 14. 22nd Year. Vol. 2. No. 11. pp. 351–352. With 1 fig.

After two laparotomies for enlarged liver, the eggs of *Fasciola hepatica* were found in the faeces having been looked for when there had been seen in the liver rounded areas with contents having the appearance of iodoform crystals.

Carbon tetrachloride was then given in dosage of 2·4 cc. three times with 14 days between doses, the liver became normal in size and ova were no longer seen in the faeces. *C. L.*

AFRICA (Candido M.), GARCIA (Eusebio Y.) & DE LEON (Walfrido). **Intestinal Heterophyidiasis with Cardiac Involvement : a Contribution to the Etiology of Heart Failures.**—Reprinted from *Philippine Jl. Public Health.* 1935. Mar.–June. Vol. 2. Nos. 1–2. 22 pp. With 23 figs. on 6 plates & 1 chart. [10 refs.] Abridged version in *Jl. Philippine Islands Med. Assoc.* 1935. July. Vol. 15. No. 7. pp. 358–361. With 4 figs. on 1 plate.

Heterophyids have been found in 9 of 108 autopsies at Manila in the wall of the intestine and their eggs in the heart in those cases in which there was examination of this organ. Six of the 9 cases justified a certificate (from anatomical findings) of death from cardiac beriberi or acute cardiac dilatation. Most of them came from provinces where raw fish and "bagong" are articles of food. There is comparison of these findings with others from dogs.

In man the worms have been identified as *Monorchotrema taichi, M. taihokui, Diorchitrema pseudocirrata* (already seen in dogs); *Heterophyes brevicaeca* (Africa and Garcia, 1935); and a *Plagiorchis* species apparently new. In the dog there have also been seen *Heterophyes expectans, Stictodora manilensis, Apophallus eccentricus,* and *Monorchotrema calderoni.*

In no dog or man have the eggs been seen in the faeces, although in dog a teaspoonful of these almost microscopic flukes has been taken from the intestine as compared with a few examples only in man. But because in man so many of these infections had had heart symptoms, the hearts of 5 of the 9 (all that could then be got) were put under microscopic examination and trematode eggs brought to view in them. So that the opinion of the authors is that, since eggs were not getting out of the hosts, man and dog are equally unnatural hosts; for which reason it has been judged wise to give above the list of those worms which have so far been seen in dog but not in man. But in dog and man the worms are present not only in the lumen of the bowel but in its wall, as is seen when this is scraped or sectioned; and the eggs

are very small 16 by 10 μ to 33 by 25 μ and capable of carriage by blood or lymph. In no case did the naked eye appearance of the intestine suggest that it had worms within it and in dogs the reactions to their presence were small, only a little congestion with petechial submucous haemorrhages, which are specially common with sudden death and in beriberi. In the heart subepicardial haemorrhages of different sizes were readily seen, most commonly on the right side. The organ was somewhat dilated with walls thicker than normal, this being caused by oedema, with which fluid all spaces between muscle fibres were overfull; the blood vessels were engorged and being, by reason of the oedema, without proper support there was often a burst with haemorrhage, and eggs visible among the red cells. The suggestion is that there is embolism of capillaries by eggs, muscular spasm from local bloodlessness, and rupture of muscle and capillaries. Many eggs may be got by squeezing a cut surface of the heart. The question comes up: Is this embolism limited to the heart? The condition of other organs has not yet been looked into, but this limiting is hardly likely. At least in "wet beriberi" there should be thought of Heterophyids as its cause. *C. L.*

AFRICA (Candido M.) & GARCIA (Eusebio Y.). **Heterophyid Trematodes of Man and Dog in the Philippines with Descriptions of Three New Species.**—*Philippine Jl. Sci.* 1935. June. Vol. 57. No. 2. pp. 253–267. With 4 plates.

The worms described and figured are: *Heterophyes expectans* n. sp. in dog, *Heterophyes brevicaeca* n. sp. in man (see p. 90), *Stictodora manilensis* n. sp. in dog, *Monorchotrema* spp. from dog and man probably *M. taihokui* Nishigori, 1924 and *M. taichui* Nishigori, 1924, and *Diorchitrema* sp., probably *D. pseudocirrata* (Witenberg, 1929).

C. L.

WATANABE (Masumi). Ueber den Körperbau des Miracidiums von *Paragonimus westermanni.* [**The Structure of the Miracidium of** *Paragonimus westermanii.*]—*Okayama-Igakkai-Zasshi* (*Mitt. d. Med. Gesellsch. z. Okayama*). 1935. June. Vol. 47. No. 6. [In Japanese pp. 1474–1479. With 6 figs. on 1 plate. German summary p. 1473.]

The miracidium of *P. westermanii* has these distinctive characters.

The ciliated covering is made up of 17 cells in 4 rows, the numbers in each row being 6, 7, 3 and 1. There is an anterior cone, no eye spots, a pair of sense organs, a pair of terminal cells, the excretory canal forming a rosette; the presence of unicellular glands and lenticular bodies is doubtful. [The fine drawings have pointers with roman letters, but they are explained by Japanese words only and so lose most of their value for those of other nations.] *C. L.*

WU (Kuang). **Notes on Certain Larval Stages of the Lungfluke,** *Paragonimus* **in China.**—*Chinese Med. Jl.* 1935. Aug. Vol. 49. No. 8. pp. 741–746. With 4 figs. on 2 plates.

A description of the second generation redia and the cercaria of the *Paragonimus westermanii.*

The rightness of identification is evidenced by the fact that the cercaria from *Melania libertina* has penetrated the leg-joints of *Potamon* crabs, with metacercariae 23 days later encysted in the leg muscles, these having the structure of those of *Paragonimus*. The cercaria is microcercous, unable to swim, but "moves like a measuring worm." An anterior spine lies on the antero-dorsal aspect of the oral sucker, there is a slender prepharynx, pharynx 0·015×0·012 mm. about midway between the two suckers, 7 penetration glands a side, 4 of them large and lateral and 3 small and medium, a tubular excretory system. Wu holds with AMEEL (*Amer. Jl. Hyg.*, 1934, Vol. 19, p. 296) that the cercaria described by FAUST (*Parasitology*, 1922, Vol. 14, p. 264) is not that of *Paragonimus*. *C. L.*

LEO (T. L.). **A Case of Paragonimiasis.**—*Chinese Med. Jl.* 1935. Aug. Vol. 49. No. 8. pp. 784–788. With 1 fig.

This is believed to be the first case of paragonimiasis from Mukden and indeed from Manchuria. A microphotograph shows the ova. It was cured by 37 grains of emetine, apparently in 3 courses.

C. L.

CHEN (H. T.). **Notes on Paragonimus in Rats.**—Reprinted from *Lingnan Sci. Jl.* Canton. 1934. Apr. Vol. 13. No. 2. pp. 329–330.

The rat is a host of Paragonimus, presumably near Canton Three of about 6 rats had 1 to 3 mature specimens of Paragonimus in their lungs, a dog had one. Local examinations of crustaceans have so far all been negative. *C. L.*

WATANABE (Masumi). Ueber die Embryonalentwicklung von *Paragonimus westermanni.*—*Okayama-Igakkai-Zasshi* (*Mitt. d. Med. Gesellsch. z. Okayama*). 1935. May. Vol. 47. No. 5. [In Japanese pp. 1173–1190. With 18 figs. on 3 plates. [11 refs.] German summary p. 1173.]

KHALIL Bey (M.) & AZIM (M. Abdel). **The Introduction of Schistosoma Infection through Irrigation Schemes in the Asswan Area, Egypt.** —*Jl. Egyptian Med. Assoc.* 1935. June. Vol. 18. No. 6. pp. 371–377. With 1 map & 2 figs.

A first step in an investigation of the effects, in a special area, of using perennial in place of basin irrigation in Egypt.

In the stretch of Nile from Assuan to Esna there have been set up 12 electric pumps to fill the irrigation waterways at all times of the year. A pump is usually at work for 3 or 4 days every 2 weeks, it sends the water into a discharge basin and from this into the main canal of the district, and a strong valve puts a stop to passage of water back into the river when the pump is no longer at work. The suggestion now is that these valves should be out of action when the pump is not in use, so that the water in the canal will make its way back into the river and the whole bed become free of water, since any hollows in it will become dry quickly in the general conditions. A survey has been made of the different helminths present in the population so that comparison may be made in the future. *C. L.*

BARLOW (Claude H.). **Further Studies of the Revival, after Drying, of the Snail Hosts of the Human Schistosomes of Egypt.**—*Amer. Jl. Hyg.* 1935. Sept. Vol. 22. No. 2. pp. 376–391. With 2 figs.

The winter closure of irrigation waterways in Egypt has a great effect on health by causing the death of many larval hosts of schistosomes and of the schistosome larvae in such molluscs as are still living after it.

The work is an addition to that already noted in this *Bulletin* (1933, Vol. 30, p. 674). After about 40 days of the slow drying which takes place in the irrigation waterways during winter, 91 per cent. of 562 *Planorbis boissyi* and 90 per cent. of 199 *Bulinus contortus* were still living. When after such drying snails were put aside in the laboratory they were found living up to as much as 180 days of drying, and the belief is that, on account of the small numbers which by that time were still there to be used for testing, the time limit is probably longer. The marked effect of drying on the percentage of infected snails is seen in the table.

Comparison of infection percentages in snails revived after desiccation and those living in water.

(Canal V.)

Date of collection	Species	Total collected	Number examined	Per cent. infected
Sept., 1934 ...	*P. boissyi*	69 (from water)	69 (undried)	69·5
Sept., 1934 ...	*B. contortus*	126 (from water)	126 (undried)	22·2
Jan. 15, 1935...	*P. boissyi*	27 (dry)	27 (revived)	29·6
Jan. 15, 1935...	*B. contortus*	61 (dry)	61 (revived)	4·9
Jan. 27, 1935	*P. boissyi*	210 (dry)	172	5·8
Jan. 27, 1935	*B. contortus*	537 (dry)	161	0·0

Then, too, it is clear that this disappearance of infection is in part caused by death of the larval schistosomes in the mollusc. "There are thousands of miles of canals which are the ideal habitat of both species of significant snails, which show no infection at all at the end of the winter closure, and this has a tremendous bearing on the control problem." Again, when put in water after drying the molluscs lay many more eggs in the same time than do those which have not been dried. *C. L.*

SCARTOZZI (Cesare) & PARVIS (Flavio). Contributo allo studio della formula leucocitaria nella bilharziosi vescicale egiziana. [**The Differential Leucocyte Count in Bilharziasis in Egypt.**]—*Giorn. di Batteriol. e Immunol.* 1935. Oct. Vol. 15. No. 4. pp. 571–582. [12 refs.] English summary (5 lines).

"The author studying from the haematological standpoint 67 cases of 'Egyptian bladder bilharzia,' found a general average of 13·7 per cent. eosinophile (maximum 42 per cent.), and of 10 per cent. monocyte (maximum 26 per cent.).

"In some cases moreover they remark that there is a sort of antagonism between eosinophilia and monocytosis." *C. L.*

See also p. 148, SALAH, **Helminthic Anaemias in Egypt.**

GIORDANO (Mario). Lo stato attuale della schistosomiasi in Libia, con speciale riguardo alla schistosomiasi vescicale nel Fezzan.—*Arch. Ital. Sci. Med. Colon.* 1935. July 1. Vol. 16. No. 7. pp. 510–515. English summary (3 lines).

ADAMS (A. R. D.). **Studies on Bilharzia in Mauritius. II.—The Recovery of Adult** *Schistosoma haematobium* **after Development in** *Bulinus* (*Pyrgophysa*) *forskali*.—*Ann. Trop. Med. & Parasit.* 1935. July 17. Vol. 29. No. 2. pp. 255–260.

The chain of infection has been completed from miracidium to cercaria in *Bulinus forskali* and from cercaria to fully developed *S. haematobium* in the mouse in Mauritius.

For the first links in the chain see this *Bulletin*, 1934, Vol. 31, p. 774. Adams at first made use of but few cercariae, not more than 500 and usually many fewer, and got no infection in guineapigs and mice (*Ann. Rep. Bact. Lab. Mauritius for 1934*). He makes note, too, of the fact that reading of work on the subject gives the mind the strong idea that overinfection of test hosts is the great danger in these tests. But when a clean laboratory-bred mouse was put in the way of infection for 2 hours at a time by all cercariae coming freely from specimens of *B. forskali* there was full growth of worms. The complete time was 24 hours in 12 days and the number of molluscs about 24. Natural death of the mouse took place after 4 months and there were got from it these rough numbers of male and female *S. haematobium*—from the liver and portal vein 60, from the mesenteric vessels 20, from the lungs 120. Males were about 12 times as many as females. The normal salt solution in which the parts were dissected had on centrifuging many typical eggs, from them came miracidia which in turn made their way into *B. forskali*. All worms in the mouse were of full development and had in all chief details the structure of *S. haematobium*. *C. L.*

FAUST (Ernest Carroll). **Some Newer Aspects of Schistosome Infection in the Western Hemisphere.**—*Jl. Trop. Med. & Hyg.* 1935. Oct. 15. Vol. 38. No. 20. pp. 249–259. [76 refs.]

After a historical account of the species of molluscs in question, expression is given to the belief that bilharzia infection came to America in slaves and that the only "reservoir host" in the New World is the imported West African green monkey *Cercopithecus sabaeus*. The molluscs acting as hosts of the larvae are members of the genus *Australorbis*, this genus having as type *A. olivaceus* Spix, 1827, and as other species firstly *A. glabratus* (Say, 1818) with the synonym *A. guadeloupensis* Sowerby, 1821, secondly and possibly *Planorbis centimetralis* Lutz, 1918 and *P. antiguensis* Sowerby, 1877, the genus being exclusively American in distribution. A key is given to all Planorbidae. The known endemic foci are considered in detail and are—Northern Brazil, Venezuela, Dutch Guiana, St. Lucia, Martinique, Guadeloupe, Antigua, St. Kitts, Nevis, Montserrat, Vieques and Porto Rico ; as to all others the statement is made that the presence of Mansonian schistosomiasis should be accepted in them only after the strongest evidence for it has been put forward. After consideration of the life-cycle and tissue changes, it is pointed out that the importance of the infection in public health can be known, and steps for its control can be undertaken, only after there is detailed

knowledge of the wideness and varying intensity of its distribution.

[The mollusc is cited in the paper as *centrimetralis*. The name was given by LUTZ in *Memorias do Instituto Oswaldo Cruz* 1918, Vol. 10 and both in the Portuguese version (p. 73) and the English one (p. 52) the spelling is *centimetralis*, which is therefore the valid name.]

C. L.

EL SALAM (A. Abd). **A New Antigen for the Diagnosis of Bilharziasis by the Complement Fixation Test.**—*Jl. Egyptian Med. Assoc.* 1935. May. Vol. 18. No. 5. pp. 353–355.

In this article the author makes a preliminary report on the antigenic properties of an extract of *Schistosoma bovis* worms which had been collected from the mesenteric veins of infected cattle, subsequently washed in saline, dried in an incubator at 37°C. for 48 hours and then kept in a desiccator over calcium chloride.

Two different extracts were tried :—

(1) An alcoholic extract made with 1 gm. of the worm powder extracted with 100 cc. of rectified spirit for 48 hours at room temperature and subsequently concentrated to half its bulk by means of an electric fan.

(2) A saline extract consisting of a 1 per cent. extract of powdered worms in 0·5 per cent. carbolic saline for 48 hours and subsequently cleared by centrifugation at 4,000 r.p.m. for 10 minutes.

Of 10 sera derived from patients containing eggs of *S. mansoni* or *S. haematobium* in their excreta, 9 gave positive complement fixation reactions with the saline extract, but all were invariably negative with the alcoholic extract. On the other hand 10 sera from cattle infected with *S. bovis* reacted negatively to both extracts.

Two strongly syphilitic sera from patients who had never suffered from bilharzia reacted negatively, as did 10 sera from persons harbouring intestinal parasites, but not infected with bilharzia.

Cholesterin reinforcement is stated to have enhanced the degree of fixation in bilharzia positive sera, but introduced an error inasmuch as syphilitic sera tended to react.

[The fact that the sera of patients infested with *S. mansoni* and *S. haematobium* reacted positively with an antigen prepared from an animal schistosome is in accord with the well established conception of the group nature of this reaction. That *S. bovis* antigen failed to react with the sera of animals harbouring its own parasite is surprising, but still more so is the uniform failure of an alcoholic extract of a schistosome to react with bilharzia infested sera when the corresponding saline extract was effective. This finding is contrary to the experience of other workers on this subject]. *N. Hamilton Fairley.*

NIEVA (Dominador E.). **Epileptiform Convulsions probably due to Schistosomiasis. (Report of a Case.)**—*Bull. San Juan de Dios Hosp. Manila.* 1935. July. Vol. 9. No. 7. pp. 234–237.

The striking finding in the stool examination was the presence of the ova of "Schistosomum Haematobium" in the stool of the patient, aged 39, of whom there is no note that he had ever been out of the Philippine Islands. He had also for a year had convulsive attacks about twice a week. He was given tartar emetic intravenously

and later emetine hypodermically and had no further convulsion during 2 months. Of the giving or not of sedatives nothing is said.

C. L.

MAINZER (Fritz). Sur la bilharziose pulmonaire, maladie des poumons simulant la tuberculose. [**Schistosomiasis simulating Pulmonary Tuberculosis.**]—*Acta Med. Scandinavica.* 1935. Vol. 85. No. 6. pp. 538–562. With 10 figs. [14 refs.]

A description of 5 cases of chronic infiltrative disease of the lungs, with mimicry of tuberculosis, and in addition a large spleen, eosinophilia, and cure by antimony. One of them had at the same time intestinal and urinary bilharziasis. The X-ray pictures are very good. *C. L.*

CLARK (Eugene) & GRAEF (Irving). **Chronic Pulmonary Arteritis in Schistosomiasis Mansoni associated with Right Ventricular Hypertrophy. Report of a Case.**—*Amer. Jl. Pathology.* 1935. July. Vol. 11. No. 4 (65). pp. 693–706. With 2 plates. [17 refs.]

A Porto Rican negress of 21 with Mansonian schistosomiasis died of congestive heart failure and pulmonary arteritis, the intima of the pulmonary artery being slightly thickened with atheromatous plaques.

She left Porto Rico when 9 and had lived at New York since. At 14 palpitation and shortness of breath came on, and later ascites and oedema. The necropsy showed the signs of backworking with dilatation of the cavities of the right heart and a dilated pulmonary artery with the lesions noted. In the lungs were areas of marked congestion, granulomata often with giant cells in them surrounding ova, and the lesions secondary to a rise in arterial pressure. No Wassermann test was made. The reference under "Bey" is to S. AZMY, this *Bulletin,* 1932, Vol. 29, p. 411. *C. L.*

MEDULLA (Candido). La fuadina nella cura della bilharziosi vescicale [**Fouadin in the Treatment of Urinary Schistosomiasis.**]—*Arch Ital. Sci. Med. Colon.* 1935. Sept. 1. Vol. 16. No. 9. pp. 658–663. With 1 fig. English summary (4 lines).

The patient, a man of 18 years, a native of Derna (Cyrenaica) suffered from painful micturition and haematuria 20 days after bathing in a stagnant pool near the Bu Mansur waterfall. Ova of *Sch. haematobium* were numerous in a centrifuged specimen of his urine. He was treated with fouadin injected intramuscularly on alternate days, starting with 1·5 cc., then 3·0, and then 5·0 cc. till cured. After the fifth injection blood was still present but ova were very scarce; after the seventh micturition was no longer painful, blood was not seen, nor ova in the centrifuged deposit. *H. H. S.*

LEE (C. U.) & CHU (H. J.). **Simple Technique for studying Schistosome Worms in Vitro.**—*Proc. Soc. Experim. Biol. & Med.* 1935. June. Vol. 32. No. 9. pp. 1397–1400. With 1 fig.

"A simple technique is described for maintaining the life of adult schistosomes *in vitro* over a period of several weeks which, with frequent changes of medium, may be extended to 2½ months. This

is made possible by the use of small tissue culture flasks, which prevent bacterial contamination and desiccation of the media. The latter may be either horse, sheep or rabbit sera or human ascitic fluid."

The authors' description and figures make the steps of the procedure and the reasons for their use very clear. *C. L.*

LEE (C. U.) & CHUNG (H. L.). **Action of Various Organic Antimony Compounds on** *Schistosoma japonicum* **in Vitro.**—*Proc. Soc. Experim. Biol. & Med.* 1935. June. Vol. 32. No. 9. pp. 1400–1403.

Using the technique of LEE & CHU described above and sheep serum or ascitic fluid as the medium in which the worms were kept the authors come to these conclusions :—

"The lethal action of sodium antimonyl tartrate, fouadin, urea-stibamine and neostibosan on *Schistosoma japonicum* is studied *in vitro* and the results support the prevalent belief that the trivalent antimony compounds are more effective in the treatment of schistosomiasis than pentavalent salts and our own clinical experience that permanent cure of *Schistosoma japonica* results more readily with tartar emetic than with fouadin." *C. L.*

KHAW (O. K.). **Concentrated Fouadin in Treatment of Schistosomiasis Japonica in Rabbits.**—*Proc. Soc. Experim. Biol. & Med.* 1934. Dec. Vol. 32. No. 3. pp. 520–522.

A treatment by 6 weekly intramuscular injections of concentrated fouadin was given to rabbits as soon as eggs were seen in the faeces, the infection being deliberate. These are the details.

The rabbits weighed 1·5 to 2 kgm., the drug is antimony III-pyrocatechin-disulphate of sodium and calcium, there being 14·3 mgm. of Sb III and 7 mgm. of calcium in every cc. The doses were 0·15, 0·25, 0·3, 0·3, 0·3 and 0·3 cc. Of 20 treated 14 were cured, 1 was uncured and 5 died. Of those who died only one had a complete treatment; the livers showed more general fatty change than did the untreated controls. Of the 7 untreated controls 5 died and 20 to 50 per cent. of eggs in their tissues were dead. *C. L.*

CAWSTON (F. G.). **The Control of Bilharzia Infection in the Union.**—*South African Med. Jl.* 1935. Aug. 10. Vol. 9. No. 15. pp. 519–520.

The paper's title is the measure of its scope.

For "species sanitation" there must be identification of species, in other words co-operation of conchologist and sanitary officer; and here the coming of Major CONNOLLY's final report will be of great value. Cawston is unable to distinguish between *S. haematobium* and *S. mansoni* in their adult or cercarial stages, only the eggs being, he holds, different. The optimum habitat of Physopsis is the under surface of the smooth leaf of the "light blue water lily or the broad-rush" but the molluscs have a loose hold on the leaf and easily fall off. In discussion on the distribution of the molluscs it is noted that *Physopsis globosa* is in the Union a carrier of *S. bovis* as well as of *S. haematobium.* "This ovine [*sic*] parasite is readily distinguished, for the adult worms possess only 3 glands and the ova are long and spindle shaped." Drying is believed to put to death

old molluscs more easily than young ones, but increase of transport and introduction of water plants has brought about a spread of the disease. *C. L.*

CAWSTON (F. Gordon). A Consideration of the Antimony Content in Drugs used for the Destruction of Schistosomes.—*Jl. Trop. Med. & Hyg.* 1935. July 15. Vol. 38. No. 14. pp. 169–170.

HUNNICUTT (Thomas N.), Jr. **An Anemia associated with a Fish Tapeworm** (*Diphyllobothrium latum*) **Infestation.**—*Jl. Amer. Med. Assoc.* 1935. June 1. Vol. 104. No. 22. pp. 1984–1986. With 1 chart.

An immigrant from Finland, in the United States since 1921, had anaemia cured by liver treatment, cure maintained by passage of tapeworms.

The blood cells were 1,370,000 and 4,600, Hb. 34 (Sahli), reticulocytes 0·6 and eosinophils 1·5 per cent., marked anisocytosis, poikilocytosis, " 3 normoblasts and 1 megaloblast." He was given " liver extract " parenterally into the glutei in maximum doses for 10 days and thereafter " capsules of liver-stomach concentrate " for 4 months. In 8 weeks he had a normal blood. Five months after he was first seen he was given male fern, passed 4 worms and segments of others and was found dewormed a month later. His blood values continued to be good. *C. L.*

PETRUSCHEVSKY (G. K.) & BOLDYR (E. D.). Propagation du bothriocéphale (*Diphyllobothrium latum*) et de ses larves plérocercoides dans la région du Nord-Ouest de l'U.R.S.S. [**Spread of** *Diphyllobothrium latum* **and its Larva in U.S.S.R.**]—*Ann. Parasit. Humaine et Comparée.* 1935. July 1. Vol. 13. No. 4. pp. 327–337. [25 refs.]

A paper of great local importance since it gives a list of all Baltic fish parasitized with plerocercoids of *D. latum*, with the degree of infection organ by organ. *C. L.*

WOODBURY (Lowell A.). **Infectivity of the Plerocercoids of** *Diphyllobothrium cordiceps* **(Leidy) for Man.**—*Jl. Parasitology.* 1935. Aug. Vol. 21. No. 4. pp. 315–316.

Woodbury has not been able to cause infection of himself though in 2 groups of tests he swallowed plerocercoids of *D. cordiceps*.

These plerocercoids are the cause of a wormy state in the flesh of the Yellowstone Lake trout *Salmo lewisi*. SKINKER (*Jl. Parasit.*, 1932, Vol. 19, p. 162) has seen no difference between the strobiles of *D. latum* and *D. cordiceps*, so Woodbury makes the suggestion that here is a " physiological species." *C. L.*

IWATA (Seishun). **Some Experimental Studies on the Regeneration of the Plerocercoid of Manson's Tapeworm,** *Diphyllobothrium erinacei* **(Rudolphi), with Special Reference to its Relationship with** *Sparganum proliferum* **Ijima.**—Reprinted from *Japanese Jl. Zool.* 1934. Sept. Vol. 6. No. 1. pp. 139–158. With 43 figs. [33 refs.]

After transplantation of injured plerocercoids of *D. erinacei* there were seen branched forms, but though they had the same morphology

as *S. proliferum* the conclusion that the two species are the same is not safe. *C. L.*

HUNNINEN (Arne V.). **Studies on the Life History and Host-Parasite Relations of** *Hymenolepis fraterna* (*H. nana*, **var.** *fraterna*, **Stiles) in White Mice.**—*Amer. Jl. Hyg.* 1935. Sept. Vol. 22. No. 2. pp. 414–443. With 2 charts & 7 figs. [11 refs.]

By a special method the cysticerci in the villi were counted, while eggs were tested by smear and D.C.F. In these ways conclusions were come to regarding the life history. The technique is as follows:

"The entire small intestine was placed in tap water in the ice-box overnight. The next day the mucus could be removed by shaking the intestine in water. The intestine was then cut into convenient lengths and spread in a Petri dish with the tips of the villi up. Just enough water was added to . . . cover the intestine. The cysticercoids could then be counted directly with the aid of the medium power of a dissecting microscope."

Infected and non-infected mice lived together and watch was kept on them till they died. Since eggs are infective when passed, since mice eat faecal pellets, since the latent period before the new strobiles produce eggs is 14 to 20 days and since 6 of 9 negative mice began to pass eggs 14 to 29 days after being put with infective ones, they must have become infected at once. In the absence of reinfection, infection continued for 2 to 56 days. But when conditions were those making for natural reinfections there became evident a resistance to infection shown by egg-negative periods, by fewer eggs when they were present, and finally after 100 days by complete absence of eggs for long periods. This was not due to any loss of coprophagic habit, for artificial infections also failed at this period. Two other curious immunity features were seen. Two to three days after giving birth to a litter she-mice lost their infections, becoming negative to D.C.F.; again 3 mice which had passed no eggs for 252, 255 and 329 days began to do so, and then died in 17 to 60 days. Nearly all cysticercoids are in the first half of the intestine. Of eggs given in food to mice, up to at least 55,000, only 4·1 per cent. become cysticercoids, and similar percentages show that nearly all cysticercoids become adults. About 35 per cent. of eggs fed to a mouse are passed *per anum*, many of them viable. There is full development of cysticerci in 93 to 96 hours, though suckers appear before hooks. Tests on 47 mice and 26 rats fed with known numbers of eggs show that up to 102 hours there is no drop in the numbers of cysticercoids in villi; at 115 hours these drop to one-third, at 144 hours there were few or none in villi. With a single infection there is retardation of growth of some strobiles so that when those whose development has been rapid die, the others grow; thus with a short adult life for each strobile there may be a long infective period for the host. Immunity to a second infection shows itself in the number of cysticercoids which develop, but whether its cause is in the earlier cysticercoids or in adults is unknown. A dose of 250 to 500 eggs was enough to give immunity against a second infection. There is age resistance under 1 and over 5 months of age. [See also this *Bulletin*, 1924, Vol. 21, p. 551; 1925, Vol. 22, p. 478.]

C. L.

DEW (Harold R.). **Advances in Our Knowledge of Hydatid Disease during the Twentieth Century.**—*Brit. Med. Jl.* 1935. Oct. 5. pp. 620–622.

There must be no complacency, with failure to advance knowledge of this subject. Advance is needed in spite of the additions to our knowledge during the last 35 years.

Australian surgeons had long maintained that secondary infections could take place when a primary cyst was opened; of this DÉVÉ gave the proof, and the knowledge has made surgery quite different. Dew's report of the first alveolar hydatid in Australia wrecked the main and geographical argument of those whose belief was that it and ordinary hydatid are different animals. On the pathology of special organs it is remarked that in about three-fourths of cases it is some leakage which causes the patient to see a doctor; and that there is not enough knowledge of the rate of growth of cysts, their primary position in the young, and the numbers and sorts of complications. X-rays and immunological tests have completely altered diagnosis. Treatment is still surgical and formalinization has made it much simpler; there is still uncertainty on the best line of operation for a deep cyst of the lung, the cerebral cyst has its special difficulties, and the question of exploring the common bile duct in intrabiliary rupture will always be difficult. *C. L.*

BARNETT (L.). **A Department for Hydatid Disease Research and Prevention.**—*New Zealand Med. Jl.* 1935. Aug. Vol. 34. No. 182. pp. 258–260.

Officials of the New Zealand Agricultural Department from records kept of slaughter-house findings have reported that hydatid cysts were present in lungs or liver or both organs in 5 per cent. of lambs and calves and up to 50 (in some districts as much as 90) per cent. in aged animals. The author estimates that at the present time some ten million of the New Zealand sheep are infested.

The prevalence of hydatid disease in man, though diminishing in some parts of the country, is still fairly common in others. Apart from cases among private practitioners about a hundred are treated in hospitals, more in the South Island. By way of propaganda a Hydatid Poster has been printed and widely distributed at post offices, schools, county council and borough meeting rooms, abattoirs, shearing sheds, etc. Now, a department for research on and prevention of the disease has been inaugurated at the Medical School of Otago University to investigate the biological, pathological and clinical aspects of the subject. *H. H. S.*

SCHMIDT (K.). Die Echinokokken-Krankheit in Palästina. [**Hydatid Disease in Palestine.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1935. Nov. Vol. 39. No. 11. pp. 453–464. With 1 fig.

Hydatid infection is a serious problem in Palestine.

Since 1922 there have been 129 cases of hydatid cysts admitted to hospitals in Palestine. The cause is easy to see, for about 70 per cent. of the sheep and 40 per cent. of cattle in the slaughter houses are infected and the condemned material is not properly disposed of, so that jackals as well as dogs are concerned in the spread of the infection.

C. L.

CLAESSEN (Gunnlaugur). **On Echinococcus in the Lung.**—*Acta Radiologica.* 1935. Sept. 15. Vol. 16. No. 5. pp. 601–615. With 9 figs. (8 on 2 plates).

Hydatid cysts of the lung, not liver cysts which have made a passage through the diaphragm into the lungs, are rare in Iceland, 1·5 per cent. of 682 cases.

This figure is in contrast to the 18 to 25 per cent. present in Australia in DEW's belief, and Claessen holds that knowledge needs to be filled in on this point and on others. One of these is possible carriage by air, a method favoured by Australian writers, yet Iceland farmers feed their stabled animals indoors with dry taenia-infected hay. A full description with beautiful X-ray pictures is given of a pulmonary case in which, after the host tripped, there was a burst into a bronchus, so that death from suffocation almost came about. While the cavity did not empty it did not become septic and its position having been seen by X-rays it was drained through the thoracic wall. It is noted that in the lung the cyst is rarely old before it bursts and for that reason the fibrous reaction to it is rarely great and the formation of daughter cysts is equally rare. Natural healing with expectoration of the contents is common. In an earlier lung case of the author's followed for 14 years no secondary cysts were ever seen. *C. L.*

DANG (Jemadar Manohar Lal). **An Unusual Site for a Hydatid Cyst.** —*Indian Med. Gaz.* 1935. Oct. Vol. 70. No. 10. p. 566.

A Sikh, aged 23 years, came to hospital with a small swelling just below the angle of the left jaw. It had been increasing gradually for a year and a half. It was thought at first to be glandular, but no others were affected, and the swelling was noticed to be fairly mobile and cystic, although extending fairly deeply. At operation it proved to be a hydatid cyst about as large as a hen's egg, beneath the deep cervical fascia and lying on the left submaxillary gland.

H. H. S.

TURNER (Edward L.), DENNIS (E. W.) & BERBERIAN (D. A.). **Studies on the Production of Artificial Immunity against** *Echinococcus granulosus* **in the Definitive Host. (The Results of Four Years Investigation of this Problem.)**—*Jl. Egyptian Med. Assoc.* 1935. Aug. Vol. 18. No. 8. pp. 536–546.

The authors report that some immunity has been obtained in the dog to infection with *Echinococcus granulosus* by injection of an antigen obtained from hydatid cysts.

The work comes from the American University of Beirut, Syria. About a quarter of the street dogs have the strobile. Those used for testing were believed to be clean. From 3,000 to 50,000 scolices were given in food to 19 controls, 18 became infected, 13 heavily so. Six dogs had 5 injections of 1 per cent. phenolized antigen made from the cuticular and germinating membrane of sterile cysts; when fed, 21 to 27 days later, with 1,000 to 10,000 scolices, 3 were negative, 2 were heavily infected and the sixth was judged to have been infected before. Thirty-two dogs were given 2 to 5 injections of a 1 per cent. suspension of scolices and membrane from fertile cysts, 17 became infected, 15 free from infection after being fed with "infected

material" at an interval of 6 to 122 days after the last injection. Twenty-three dogs were given 1 to 5 doses of antigen, being a suspension of 1,000 to 20,000 scolices from fertile cysts, and fed with infective material 4 to 238 days after the last injection, and autopsy was made 24 to 131 days later; 10 had no infection and 5 had heavy infections. The Casoni reaction was useless in determining whether a dog had the tapeworm. *C. L.*

DIXON (H. B. F.) & SMITHERS (D. W.). **Cysticercosis** (*Taenia solium*). —*Jl. Roy. Army Med. Corps.* 1935. Apr., May, June, July & Aug. Vol. 64. Nos. 4, 5 & 6; pp. 227–234; 300–306; 375–380; Vol. 65. Nos. 1 & 2. pp. 28–34; 91–98. With 10 figs. [68 refs.]

A valuable collection of knowledge on this subject set out clearly. It will no doubt be in constant reference in the future. The authors' conclusions are these :—

"(1) Cysticercosis (*Taenia solium*) is a disease far from uncommon, especially in those who have lived in countries where sanitation is defective.

"(2) It is deserving of more recognition than it now obtains in medical and neurological textbooks, as its manifestations are both varied and variable.

"(3) The older descriptions of the disease are misleading in that any case may present various symptoms at different stages of the disease, and if the case is followed up to the end mental and/or nervous symptoms almost invariably occur.

"(4) Any patient previously healthy who develops fits or anomalous nervous or mental symptoms, and who has lived abroad, should be suspected of suffering from cysticercosis until proved otherwise.

"(5) Unless evidence of cysticercosis is systematically sought for the diagnosis may be missed, as the subcutaneous nodules which are suggestive of the disease may be absent at the time of the examination, only to come out in crops at a later date, remaining for a varying period of time and then disappearing, and radiological evidence may not be convincing for some years, as calcification does not usually take place until some four or five years after infestation.

"(6) Every case suspected of cysticercosis should be re-examined at six-monthly or yearly intervals for the presence of subcutaneous nodules and calcification of cysts in the soft parts.

"(7) There is no known treatment for the disease. Administration of luminal and bromides keeps the fits in check in some cases.

"(8) The prognosis is bad.

"(9) There is every reason to believe that prophylactic measures properly applied would considerably reduce the incidence of the disease which has decreased in most countries with the advance of modern sanitation and hygiene." *C. L.*

GRADO (Giuseppe). Cisticercosi muscolare disseminata. [**Disseminated Muscular Cysticercosis.**]—*Riv. Sanitaria Siciliana.* 1935. May 15. Vol. 23. No. 10. pp. 742–744, 747–752, 755–757. With 6 figs. French summary (8 lines).

Two cases of cysticercosis are described, both women, one aged 43, the other 34 years. The former had been treated 4 years previously for taeniasis and the worm was expelled and she had seen no fragments since. During the past year, however, she suffered from pains in the legs, cramps and formication. X-rays revealed numerous small opacities of calcified cysticerci in the muscles of the back, arms and

legs, while in the second patient, though in fair numbers, these were much fewer than in the first. Neither presented any sign of epilepsy or cerebral involvement such as has been described by MacArthur.

H. H. S.

Chung (H. L.) & Lee (C. U.). *Cysticercosis cellulosae* **in Man with Special Reference to Involvement of Central Nervous System.**—*Chinese Med. Jl.* 1935. May. Vol. 49. No. 5. pp. 429–445. [20 refs.]

A study of 10 more cases of cysticercosis of the central nervous system.

Detailed accounts of the cases and their symptoms and cerebrospinal findings are put out in tables. Palpable subcutaneous nodules were present in 8, in the other two they were seen in the brain at operation or necropsy ; epileptiform fits in 8, headache in 6, numbness or paresis in 5, fever in 5, nausea and vomiting in 4, transient motor aphasia, blurred vision, dizziness, drowsiness, or eosinophilia in 3. There was a tapeworm in 4, leucocytosis in 6, and bilateral papillitis with or without other signs in the fundi in 3. A condition of exophthalmic goitre in one was put down to cysticerci in the thyroid. As to the cerebrospinal fluid, the pressure was between 80 and 350 mm. of water, leucocytes between 2 and 440 in the cmm., neutrophils in the same from 0 to 47 and lymphocytes from 53 to 100 per cent.

C. L.

Lindeman (S. J. L.) & Lyburn (R. St. John). **Notes on Two Cases of Epilepsy due to Cysticercosis, with Other Suggestive Cases.**—*Jl. Roy. Army Med. Corps.* 1935. Aug. Vol. 65. No. 2. pp. 116–123.

There is description of 8 cases in all in a battalion which had come to Khartoum from India.

Two patients had fits with cysticerci, 4 had nervous symptoms without cysticerci, and lastly two had cysticerci whose discovery took place when every soldier was examined as the result of the finding of the other 6 cases.

C. L.

Dogra (J. R.) & Ahern (D. M.). **A Case of Cysticercosis.**—*Indian Med. Gaz.* 1935. Sept. Vol. 70. No. 9. p. 510.

Fits and nodules. Excision of a nodule made the diagnosis certain.

C. L.

Matsuura (Toshio). Ein Fall von Cysticercus Cellulose Hominis.—*Jl. Oriental Med.* 1935. Sept. Vol. 23. No. 3. [In Japanese pp. 627–629. With 1 plate. [12 refs.] German summary p. 36.]

Ochoterena (I.). Contribución para el conocimiento de la histopatología de la cisticercosis cerebral humana en México. [**Histopathology of Cerebral Cysticercosis in Man in Mexico.**]—*An. d. Inst. Biol.* Mexico. 1935. Vol. 6. No. 2. pp. 79–88. With 10 figs. English summary (4 lines).

Owing to the slow evolution of the cyst the cysticercus becomes enclosed in a chitinous capsule with a surrounding zone containing

many leucocytes, lymphocytes and granulocytes, epitheloid cells, macrophages, and products of degeneration, fatty corpuscles, etc., at times disposed in rosette form. Outside this are collagen and elastic fibres, together with monocytes, epithelioid cells, eosinophiles and above all plasma cells which may be so conspicuous as to merit the term plasma cell layer. Morula cells are also seen and are well depicted in one of the photomicrographs illustrating this article. The vessels show marked endarteritis. The necrotic nerve tissue is circumscribed by a barrier of neuroglia. The general appearance of the lesions set up bears a marked resemblance to those of general paralysis. It may be noted further that the cerebrospinal fluid of these cases has been reported to give a positive Wassermann reaction. *H. H. S.*

TRAWÍNSKI (A.) & ROTHFELD (J.). Ueber Anwendung der Präzipitationsreaktion zum Nachweis der Gehirnzystizerkose beim Menschen. [**Precipitin Reaction in Diagnosis of Cysticercus of the Brain.**]—*Zent. f. Bakt.* I. Abt. Orig. 1935. Sept. 5. Vol. 134. No. 7/8. pp. 472–474.

Precipitin reaction proved itself specific for cysticercus of the brain. Of the 4 cases one was verified at necropsy, a second had cysticerci in the skin, in the third the diagnosis was probable and in the fourth a positive precipitin reaction was the only suggestion of a cause for the fits. The reagent was formed by dried scolex from a cysticercus diluted with 500 times the amount of normal saline. *C. L.*

KERR (K. B.). **Immunity against a Cestode Parasite,** *Cysticercus pisiformis.*—*Amer. Jl. Hyg.* 1935. July. Vol. 22. No. 1. pp. 169–182. [10 refs.]

Active and passive immunity to infection by the cysticercus has been effected by injections ot material got from the strobiles of *Taenia pisiformis.*

In 35 rabbits injections were made (under the skin or into veins or peritoneum) of material from fresh or dried worms. When these rabbits were then given meals of hundreds of onchospheres there were no cysticerci to be seen on the outsides of their livers in 34 of them. One infection gave a measure of active immunity against a second one, and injection of serum from a rabbit which had infection into one which had not (at the rate of 2 per cent. of body weight) gave the second some immunity amounting to 4 of 8 animals in one experiment. *C. L.*

AFRICA (Candido M.) & GARCIA (E. Y.). **The Occurrence of Bertiella in Man, Monkey and Dog in the Philippines.**—*Philippine Jl. Sci.* 1935. Jan. Vol. 56. No. 1. pp. 1–10. [16 refs.]

Comparison is made of *Bertiella* species from a Filipino child, a Philippine dog, and a Philippine monkey (*Macacus cynomolgus*).

The dog is a new host and the Philippines a new land for this genus. There is a full description and fine illustrations of the specimens. The case in the child makes the 10th reported in man, nearly all in children ; and the name *B. studeri* (synonym *B. satyri*) is kept until the synonymy of the species has been gone into, while the differences between this specimen and others are given in detail. *C. L.*

ADAMS (A. R. D.). **A Fourth Case of Human Infestation with** *Bertiella studeri* **(Cestoda) in Mauritius.**—*Ann. Trop. Med. & Parasit.* 1935. Oct. 5. Vol. 29. No. 3. pp. 361–362.

"A fourth Mauritian case of human infestation with *B. studeri* is recorded. The patient, a Hindu boy, aged 7, was in perfect physical and mental health, in spite of his infestation. Treatment with carbon tetrachloride resulted in dislodgement of the worm. Direct feeding of gravid segments, both freshly-passed and after keeping for some days, to a young *M. cynomolgus* failed to cause parasitization of the animal."

[The head was not found but no segments were being passed three months later.] *C. L.*

SCHMID (Felix). Beitrag zur Technik der helminthologischen Untersuchung. [**Contribution on the Technique of Examination for (Nematode) Worms.**]—*Zent. f. Bakt.* I. Abt. Orig. 1935. June 14. Vol. 134. No. 3/4. pp. 150–151.

A method for the collection of small nematodes from the contents of the gastro-intestinal canal.

First there is dilution of the contents with 1 per cent. soda solution, next stirring of this with a rod of glass or wood, round which these worms become wound. They are unwound by movements of the rod in normal salt solution and may then be seen by the naked eye. *C. L.*

TAYLOR (E. L.). **Do Nematodes assist Bacterial Invasion of the Host by wounding the Wall of the Intestinal Tract?**—*Parasitology.* 1935. May. Vol. 27. No. 2. pp. 145–151.

No! is the general answer to the question in the title.

The work carries on that of Taylor and PURCHASE (this *Bulletin*, 1932, Vol. 29, p. 61). *Bact. suipestifer* was the organism which was used in testing the passage of bacteria into the rabbits' blood from the intestine. In the first test 12 rabbits were given an infection with *Graphidium strigosum*, a blood sucker, and 12 were not; all were then given by stomach tube 0·01 cc. of a 24 hours broth culture of virulent *Bact. suipestifer*. Of those with *G. strigosum* infection 9 died and of those without 8; but 21 of them had also infections with the oxyurid, *Passalurus*. In the second test 27 rabbits were given infection with *Trichostrongylus retortaeformis*, a blood sucker and 24 were not; all were given by stomach 0·003 cc. of a like culture; of those with *T. retortaeformis* there was death in 18, of those without 17. *C. L.*

DE BOER (E.). Experimenteel onderzoek betreffende *Ascaris lumbricoides* van mensch en varken. [**Experimental Study of** *Ascaris lumbricoides* **in Man and in the Pig.**]—*Tijdschr. v. Diergeneesk.* 1935. Sept. 15. Vol. 62. No. 18. pp. 965–973. English summary.

The author's investigation was undertaken to solve the question of identity or not of the ascaris infesting man and that of the pig, and to determine the proportion of pigs infested with its own ascaris. He used young animals, some fed normally, others on a diet poor in vitamin A. The following series of experiments were performed: (1) Single feeding with eggs of *A. lumbricoides* from the pig (11 animals); (2) With eggs of human *A. lumbricoides* (5 animals); (3) Eight times

in successive weeks as in (1) (7 animals) ; (4) Seven times in successive weeks as in (2) (6 animals).

His findings may be summed up as follows: Repeated infection of piglets with ova of the human or the pig ascaris led to the presence of adult worms in the experimental animals, though neither natural nor experimental feeding with the ova invariably gave this result. Change of diet to vitamin A deficiency did not appear to affect this. The time for development from embryonated egg to adult worm was about 2 months.

Examination of earth worms (*Lumbricus terrestris*) living in ascaris-infested soil revealed ova of the latter in the intestine of the former, and the author suggests that earthworms may play a part in ascaris infestation [but what part he does not specify]. *H. H. S.*

JONES (T. L.) & KINGSCOTE (A. A.). **Observations on Ascaris Sensitivity in Man.**—*Amer. Jl. Hyg.* 1935. Sept. Vol. 22. No. 2. pp. 406–413.

The fact of ascaris sensitivity particularly in those who have worked with the worm is confirmed.

"Twenty-seven out of 108 subjects, mostly veterinary undergraduates selected at random, gave positive reactions to a scratch-test with 5 per cent. saline extract of pig ascaris. A period of exposure seems to be a necessary precursor and continued re-exposure may lead to at least partial desensitization. Various fractions of ascaris were similarly tested. In some subjects an eosinophilia followed the reaction.

"A positive reaction is no indication of previous infection, although previous exposure by contact may be necessary. Continued exposure does not necessarily cause sensitization however." *C. L.*

MCRAE (Anne). **The Extra-corporeal Hatching of Ascaris Eggs.**—*Jl. Parasitology.* 1935. June. Vol. 21. No. 3. pp. 222–223.

"The writer feels that the many reports of the hatching of ascaris eggs have been misleading, *i.e.*, that the 'hatching' is evidently the effect of external conditions probably in most cases mechanical injury to the egg shell and should not be interpreted as biological hatching of the eggs."

The eggs of *Ascaris lumbricoides* from the pig were used. There was almost no "hatching" in 2 per cent. formalin, on changing from 0·2 per cent. HCl to 0·5 per cent. $NaHCO_3$ at 30° or 37°C., or on alternation between 0°C. and 40°C. Sometimes "spontaneous" hatching in cultures took place, once on a great scale when a sand culture was taken some hundreds of miles by car; the probable explanation being that this was the effect of the rubbing of sand grains against the eggs. Tests showed that there was "hatching" even to 80 per cent. in 10 minutes when embryonated eggs were stirred in wet sand or when there was shaking with shot or beads. This kind of hatching came about more readily when there had been solution of the outer shell by antiformin. Freed larvae were dead within two days even in Ringer's solution at 37°C. [It seems strange that the paper has no mention of the work of BROWN, which too was done at the School of Hygiene and Public Health, of the Johns Hopkins University (this *Bulletin*, 1929, Vol. 26, p. 548). In his experience *all* eggs "hatched" when wetted after drying, another and seemingly the most important physical cause for this, and one which may have acted in McRae's cases of "spontaneous" hatching.] *C. L.*

INDIAN MEDICAL GAZETTE. 1935. June. Vol. 70. No. 6. pp. 333–334.—**Ascaris Infection and the Bore-Hole Latrine.**

After discussion on the necessity for sanitation in putting an end to ascaris infection, and on the reviewer's opinion, formed from the facts, that carriage of this infection may be by air, the author gives reasons for his belief that the bored hole latrine is the kind "most likely to be successfully used by primitive peoples."

Experience having made it clear that deworming without good sanitation sees a treated man with the old weight of infection back again within three months, right sanitation is clearly the key of the question. "Recently Clayton Lane has collected one or two records which indicate the possibility that imperfect sanitary measures actually lead to an increase in infection rate with ascaris . . . the two principal instances quoted by Lane are one of his own finding in the Darjeeling district some years ago and the other in some small villages in Panama. . . . Clayton Lane suggests that the ascaris eggs are air-borne and enter the houses to contaminate the food." [After making the statement that this suggestion came in fact from Stiles, the reviewer under the heading "Breathing in of embryonated eggs" said "But what is here in mind is infection by inspiration, the breathing in of embryonated eggs as dust."] "But this suggestion seems of doubtful accuracy, in Panama at all events, for there the rise in infection rate occurred at the height of the wet season." [In Panama CORT *et al.* gave these egg counts for "sanitated" Sardina: July, 1926, 23,190; August, 1926, 7,170; September, 1926, 15,830; February 1927, 48,540; (this *Bulletin*, 1930, Vol. 27, p. 421). And again, "There are two seasons in Panama, the dry from January to April and the rainy from April to December (CORT *et al.* this *Bulletin*, 1930, Vol. 27, p. 431)]. "If air-borne carriage of eggs after the installation of inadequate latrines is the correct explanation of the failure to reduce or to even cause an increase in ascaris infection, the bore-hole latrine should not be open to this objection, especially if bored deep enough to enter the sub-soil water, a condition which will apply in the plains of Bengal and Assam. . . . If bore-hole latrines reach the sub-soil water and not too many individuals use each one complete liquefaction of faeces will occur and the liquefied matter will percolate through the soil and so be completely lost." [A bored hole latrine is only a pit latrine made in a special way, 18 inches wide often with a lining of basket work, but entering the subsoil water. If the user is marksman enough to hit the water at the bottom, perhaps thirty feet away, he pollutes the general and moving subsoil water, the drink of most persons in the tropics. If he has the usual half-liquid stool of these parts the shrapnel effect will spatter the walls of the tube up to within a few inches of its top, from which place air carriage should take place readily if it can take place at all.] *C. L.*

NAIR (P. Kumaran). **An Epidemiological Study of Ascaris, Trichuris and Hookworm in a Coastal Village in Puerto Rico.**—*Puerto Rico Jl. Public Health & Trop. Med.* 1935. Sept. Vol. 11. No. 1. pp. 118–138. With 4 figs. & 1 plan. [Spanish version pp. 139–157.]

A study of the infections mentioned in the title made during the summer of 1932 at Salinas on the south coast of Porto Rico.

The soil is sandy, the rainfall less than 45 in. yearly, there is much irrigation, large areas of land are below high tide level and the soil is believed to have a high salt content. There are 73 families mostly white, and all are very poor. Egg counts were made of 299 out of 362 persons using 0·005 gm. of faeces. In only 4·6 per cent. were hookworm eggs seen [an obvious understatement], 73 per cent. harboured trichuris with an average count of 4,500 eggs to the gram, the figures for ascaris being 44·6 and 19,200. Graphs show the distribution by age and sex. Of the 73 families 59 took water from the city the others from a protected deep well proved free from pollution—23 families had latrines, 16 kept them clean and used them, most persons old and young went out to defaecation sites. In the map one of them bears the legend " defecation spot and playground for children " and the text says of it that it " formed a big common backyard for the houses, where children played and defecated alternately and indiscriminately." Twelve backyards had no soil pollution but embryonated ascaris eggs were found in soil samples from five of them. Most families with a low degree of ascaris and trichuris infection lived at some distance from the defaecation sites. Of 20 families free from ascaris infection soil pollution of yards was absent in 19, and such pollution is held to be the chief cause of infection. *C. L.*

CALVO FONSECA (R.), KOURI (Pedro) & BASNUEVO (Jose G.). Porcentaje y distribucion geografica del parasitismo intestinal en Cuba. (Provincia de Pinar del Rio.) [**Intestinal Parasitism in the Province of Pinar del Rio (Cuba).**]—*Rev. Parasit., Clin. y Lab.* Habana. 1935. Nov.–Dec. Vol. 1. No. 2. pp. 206–211.

Altogether 986 faecal examinations were made [the population of the district is not mentioned, but the latest figures obtainable are 301,000 in June 1928] and 612 or nearly two-thirds (62 per cent.) contained parasites, protozoal or helminthic. Protozoa only were seen in 64 (6·5 per cent.) ; worms only in 440 (44·6 per cent.) and both in 109 (11·0 per cent.). The detailed distribution in 14 townships of the Province is given in a table. The commonest was Trichuris, found in 400 of the total (40·5 per cent.), then in order Ascaris 23·5 per cent., Necator 15·4, Enterobius 1·9, *Taenia saginata* 0·4 per cent. (4 cases only). Trichuris and Ascaris were both present in 96 or 9·7 per cent., Trichuris and Necator in 4·5 and all three in almost the same proportion, 4·4 per cent.

More attention was given to search for helminthic infestation than for protozoa, but the fact is mentioned that *E. histolytica* was found in 6, Giardia in 26, and *E. coli* in 146. " Although we know that *E. nana, Chilomastix mesnili, Trichomonas hominis* . . . are fairly common in Cuba, we did not look particularly for them . . . our investigations being concentrated on searching for worm infestation." *H. H. S.*

KIRK (J. Balfour) & CANTIN (A. Y.). **Intestinal Obstruction by Roundworms following Administration of an Anthelmintic.**—*Brit. Med. Jl.* 1935. Aug. 17. pp. 298–299.

Another case of intestinal obstruction from a knot of ascarids.

A boy of 10 had severe colic after " he had taken a mixture of chenopodium and castor oils," and at operation the usual " bag of worms " was found and emptied. Cases in the literature are cited. From their rarity the suggestion is made that not only worms and anthelmintic but some third factor is necessary. *C. L.*

ROTTER (Werner). Zur Frage der Auswanderung von Spulwürmern durch die gesunde Darmwand. [**Penetration of the Healthy Intestinal Wall by Ascaris.**]—*Muench. Med. Woch.* 1935. Oct. 11. Vol. 82. No. 41. pp. 1640–1641.

Rotter's belief is that ascaris can force a passage through the healthy intestinal wall.

The case in question was a child of 3 with inflammation of the abdominal wall. At necropsy the jejunum and first part of the ileum formed a sort of sausage filled with 200 ascarids. In the first part of the jejunum was a perforation about 1 cm. across, the mucosa undermined, the hole in the muscle oblique and surrounded by a fibrotic mass and showing the muscle fibres torn apart with much polymorphonuclear leucocytosis. There was a haemorrhage about the left suprarenal, and small ones in the lungs in which no ascaris larvae were seen. *C. L.*

UJIIE (Naoki). **A Case of Empyema caused by Heterotopic Parasitism of an** *Ascaris lumbricoides*.—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1935. Sept. Vol. 34. No. 9 (366). [In Japanese pp. 1390–1395. [54 refs.] English summary pp. 1396–1397. With 2 figs. on 1 plate.]

Ascaris infestation is very common throughout Japan and the author states that he has collated records up to the end of 1934 of 207 cases of ectopic parasitism by this worm. Only 6 of these were instances of invasion of the pleura. He now places on record another, a boy of 3 years operated upon for empyema. On the third day after operation a mature but small female Ascaris emerged from the wound. The worm was only 16 cm. long but there were many fertilized ova in its uterus. Professor YOKOGAWA gave his opinion as follows: "It seems likely that this worm attained sexual maturity in the intestinal tract and after copulation escaped from there and strayed into the pleural cavity, probably a month previous to the operation. In these abnormal surroundings further growth of the body has been arrested but development of the generative organs continued until ability to oviposit was reached." In the pus were also *Bact. coli* and *Staph. aureus*.

H. H. S.

ZWIRN (D.), JOYEUX (Ch.) & ABOUCAYA (A.). *Ascaris lumbricoides* dans la cavité pleurale au cours d'une pleurésie purulente. [*Ascaris lumbricoides* **in an Empyema.**]—*Marseille-Méd.* 1935. June 5. Vol. 72. No. 16. pp. 701–715. With 4 figs.

When an empyema was opened, a dead male ascaris came out with the pus. In the faeces were eggs of ascaris and trichuris. *C. L.*

DE AZEVEDO (A. Penna). Ascaridiose hepatica. [*Ascaris lumbricoides* **in the Liver.**]—*Mem. Inst. Oswaldo Cruz.* 1935. June. Vol. 30. No. 1. pp. 115–122. With 6 plates. [17 refs.] English summary.

The author describes a case of liver ascariasis in a girl, 1 year old, who also presented intestinal parasitism by 54 adult specimens of *Ascaris lumbricoides*.

"The hepatic lesions consisted in several abscesses containing living adult worms along with dead specimens and in the formation of an inflammatory condition with pronounced production of fibrous connective tissue and lymphocytic infiltration. Special attention is attracted by the fact of the existence of numerous eggs of *Ascaris lumbricoides* in the innermost of the inflammatory tissue. The inflammatory foci met with are closely connected with the biliary ducts; the presence of eggs of *Ascaris lumbricoides* is found even within the epithelium. Apart from the zones affected by the process of ascaridiasis, the hepatic tissue is seen to be well preserved." *C. L.*

STANNUS (Hugh S.). **An Ascaris Infection. A Case in which the Diagnosis and Cure were effected by Mistake.**—*Post-Graduate Med. Jl.* 1935. July. Vol. 11. (New Ser.) No. 117. pp. 247–248. With 1 chart.

The mistake was a needling of the liver carried out by a resident medical officer.

The symptoms were in short fever, enlarged liver with pain and tenderness, coated tongue, cough and sometimes rhonchi, and wasting. There were no ova in the stool. Two days after the needling an ascaris was passed and after santonin 3 more adults. Their sex is not stated. The suggestion is made that the needle hit the worms, whereupon they actively left the bile ducts. *C. L.*

INHELDER (Heinr. E.). Drei Askariden-Fälle.—*Schweiz. Med. Woch.* 1935. June 29. Vol. 65. No. 26. pp. 600–602.

SASAKI (Tomio). **A Case of Carbon-Tetrachloride Poisoning.**—*Jl. Public Health Assoc. Japan.* 1935. May. Vol. 11. No. 5. pp. 1–3.

Another case of death from carbon tetrachloride, given in herd fashion by the "village authorities," ascaris being present but unknown.

A woman of 41 had 2 cc. of the drug fasting, and 3 hours later 80 cc. of 20 per cent. magnesium sulphate. At 4 p.m. vomiting, and diarrhoea came on. Her death took place a week later, vomiting with and without ascarids in it being frequent; the last act being collapse with coffee-ground vomit in which were more of these round worms.

C. L.

HOEPPLI (R.). **Action of** *Ascaris lumbricoides* **Substance on the Growth of Fibroblasts in Vitro.**—*Acta. Path. et Microb. Scandinavica.* 1935. Vol. 12. No. 3. pp. 281–289. With 3 figs.

As the result of carefully controlled experiments Hoeppli reaches these conclusions:—

"Extracts of fresh Ascaris lumbricoides muscle and of female sexual organs prepared with Tyrode's solution, furthermore Ascaris body fluid and salt solution in which worms had lived for four days influenced unfavorably, in varying degree, chicken fibroblasts (chondroblasts) in vitro. Since the pH of the various liquids used for the experiments was within the range suitable for fibroblast cultures, it could therefore not be responsible for the unfavorable action. The possibility that perhaps highly diluted Ascaris body fluid might stimulate the growth of fibroblasts was excluded by a series of experiments.

"The results obtained with Ascaris may serve as a basis and control for experiments with other helminths which are known to cause more severe lesions of the surrounding tissue. If substance of such worms will show an unfavorable action on cells in vitro, the results obtained with Ascaris should be considered before one regards such an action as specific." *C. L.*

MAPLESTONE (P. A.). **The Rate of Development of Hookworm Eggs.**—*Indian Med. Gaz.* 1935. July. Vol. 70. No. 7. pp. 368–370. With 1 fig.

A note to impress on students that there is quick development of eggs in the stool in the tropics, the text-book 4-celled egg being uncommon.

Eggs isolated by D.C.F. in salt or sugar solution were washed and put on one side in April and May. The shortest times for hatching noted were 5 and 10 hours. The rate was much different from day to day in stools from the same person. It seemed quicker in eggs thus isolated than in those left in the stool, and to be no different when floatation was in salt or sugar. *C. L.*

STÉVENEL (L.) & BERNY (P.). Action de la cyanamide de chaux en solution à 3/1000e sur les ankylostomes. [**Action of Calcium Cyanamide on Hookworm Eggs and Larvae.**]—*Bull. Soc. Path. Exot.* 1935. Oct. 9. Vol. 28. No. 8. pp. 714–715.

This solution, cyanide of calcium 1 in 3,000, prevented hookworm eggs from developing into embryos or destroyed within 3 days all larvae which had been allowed to develop. *C. L.*

CHANDLER (Asa C.). **A Review of Recent Work on Rate of Acquisition and Loss of Hookworms.**—*Amer. Jl. Trop. Med.* 1935. May. Vol. 15. No. 3. pp. 357–370. With 3 charts. [13 refs.]

"This critical review of the available data on seasonal fluctuations in level of hookworm infection when reinfection is discontinuous or ceases seems to me to indicate that there actually is a very decided fluctuation.

"This implies that a climate which affords a favorable and an unfavorable season for acquisition of hookworms leads to a considerable annual exchange of old worms for new. The data suggest, however, that in communities where an equilibrium has been reached there is no marked increase in egg output until about six months after reinfection has occurred. In the past it has commonly been assumed that the effect of reinfection would be reflected in egg output in from six to eight weeks, which is the time required for oviposition to begin. As soon as the egg production of the new worms has reached a high point, however, it falls off again very rapidly, presumably due to the hosts' resistance beginning to operate on the six-months-old worms, causing their expulsion at a rapid rate. If this theory is correct it would be expected (1) that sanitary reforms would be followed by a rapid lowering of the level of infection after about six months or earlier if the reforms were preceded by a season unfavorable for hookworm infection; (2) that in the absence of sanitary improvement, reinfection would occur fairly rapidly after treatment unless the whole community were treated; and (3) that mass treatments given in a season when the ground is practically free from hookworm larvae would be of much greater benefit than one given when larvae are abundant in the soil." *C. L.*

YAMASAKI (Mikio). **Clinical and Experimental Studies on Hookworm Infection.**—*Japanese Jl. Experim. Med.* 1935. Aug. 10. Vol. 13. No. 4. pp. 457–470. With 17 figs. on 3 plates.

An attempt to find out whether there is a connexion between oral hookworm infection and "young greens disease."

"Young greens disease," Wakanabyo in Japanese, is seen as an endemic in certain areas of the Tottori prefecture in late summer having as symptoms restlessness, nausea and sometimes vomiting; 3 or 4 days later they are lost and coughing comes on and may not be got rid of for months; in many of these sufferers hookworm eggs are seen in the faeces in large numbers about six weeks after the onset of symptoms. By a floatation method, seemingly an indirect centrifugal one, the percentages of hookworm infection in adults and children were—among farmers 62 and 12, and among town dwellers 15 and 7; the similar figures for ascaris were 65 and 55, and again 22 and 16. The rise of hookworm infection with age in farmers is put down to cutaneous infection through work on the land, a possible dejectional infection not being mentioned, while for ascaris this rise is absent "because the infection mode of this parasite is only in the oral way." After the giving of certain experimental results with heat and salt and of histological findings in optimum and non-optimum hosts fed on infective larvae, there is a consideration of "young greens disease" thought to be "caused by the taking of young greens, especially those of the radish variety, which have been preserved overnight in a salted mixture." Hookworm larvae were seen on radish leaves, and it is said that no one before Yamasaki had noticed respiratory symptoms in oral infections. It is noteworthy that some of the illustrations show larvae in mouth tissues, the portal system having been in this way bypassed. *C. L.*

JACOCKS (W. P.), KENDRICK (J. F.) & SWEET (W. C.). **Hookworm Incidence and Intensity in South India by Districts.**—*Indian Jl. Med. Res.* 1935. Oct. Vol. 23. No. 2. pp. 441–446. With 2 maps.

The survey by Willis's technique, alone or combined with that of Stoll, was made between 1920 and 1931. Its results are set out with maps after conversion to "basis formed stools."

Of 15,178 hookworms 7·9 per cent. were *A. duodenale.* There was a fairly low hookworm load with a fairly high incidence. *C. L.*

KHALIL Bey (M.) & SALAH (M.). **Some Clinical Manifestations of Ancylostomiasis.**—*Jl. Egyptian Med. Assoc.* 1935. June. Vol. 18. No. 6. pp. 378–388. With 2 charts.

Ankylostomiasis is the cause of symptoms from which a diagnosis of some organic disease may be made, with danger to life.

A yellow skin with no suggestion of green, no colouring of the sclera, no bile or urobilinogen in the urine and a normal icterus index. Anaemia with fever and heart murmurs, the fever going away and anaemia becoming less under large doses of iron. Symptoms like those of duodenal ulcer but with the duodenal cap present on X-ray examination, these and occult blood no longer present after deworming. Symptoms as of gastric cancer or of entero colitis. Those of nephrosis. Then there is mention of two acute cases with the usual syndrome and the making again of the point that the amount of anaemia is not parallel to the number of worms. *C. L.*

ZAU (F. D.). **Meningism of Helminthic Origin. A Survey of 43 Cases apparently due to Infection with Helminthiasis and 2 Cases apparently due to Infection with Relapsing Fever.**—*Chinese Med. Jl.* 1935. July. Vol. 49. No. 7. pp. 689–693. With 2 figs.

The presence of intestinal parasites, chiefly hookworm and ascaris, may be the cause of a meningitic condition, the proof being that with deworming the symptoms come to an end.

The cases are really of 2 sorts—a meningism with no organisms in the spinal fluid though this was slightly turbid, and a meningitis with micro-organisms and a cloudy fluid. With deworming there was recovery of all cases of the first condition and of 33·78 per cent. of 74 cases of the second; so that this aim is of great importance in any case. Treatment was by 30 minims of oil of chenopodium. Two cases of meningism caused by *Sp. recurrentis* are cited. *C. L.*

POGGI (Igino). Sull' infestione da "Anchylostoma duodenale" nel comune di Vigevano. (Nota preventiva.)—*Arch. Ital. Sci. Med. Colon.* 1935. July 1. Vol. 16. No. 7. pp. 516–525. With 1 fig. English summary (3 lines).

BONNE (C.). Over een worminfectie van de submucosa van den dunnen darm. [**Helminthic Infestation of the Submucosa of the Small Intestine.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1935. May 28. Vol. 75. No. 11. pp. 893–904. With 8 figs. English summary.

In 3 of about 3,000 necropsies on Malayan men and women in Batavia, Bonne has seen nematodes on the submucosa, among haemorrhages.

Case I.—Many eggs and larvae of hookworm type and size.

Case II.—A worm 0·3 mm. across with buccal capsule and strong chitinoid hooks, and biting fiercely into the circular muscle. Only 3 sections available. Apparently an immature female or a male, there being no eggs or larvae.

Case III.—Well developed buccal capsule with teeth and too much blood in it to clear properly. Worm about 0·6 mm. across. Eggs and larvae in submucosa. The man died of purulent peritonitis from "a perforation in the wall of a very much narrowed part of the jejunum, 60 cm. below the pylorus." *Ancylostoma duodenale* is not so common in Batavia as is *N. americanus.* *C. L.*

VAN SLYPE (W.). Recherches pathogéniques et thérapeutiques sur l'ankylostomiase. [**Ankylostomiasis. Pathological and Therapeutic Studies.**]—*Ann. Soc. Belge de Méd. Trop.* 1935. Sept. 30. Vol. 15. No. 3. pp. 421–467. With 4 figs. [38 refs.]

A detailed study of 48 cases of "ankylostomiasis" with special reference to blood loss, material used, quantitative diagnosis, red cell and haemoglobin values, lysins, corpuscular resistance, urobilinuria, bilirubinaemia, pathology, and slight infections.

In these cases care was taken to exclude, as far as possible, syphilis, alcoholism and malaria. A discussion on blood loss *versus* toxins brings the conclusion that there is blood loss, and that the nature of a possible toxin is as yet unknown. The material used was made up of 48 indigenous males between 18 and 40 years of age and mostly young. Under the heading ankylostomes are included Ancylostoma,

Necator, Ternidens and Trichostrongylus, which locally have been found present in percentages of 74, 63, 19 and 10. Quantitative diagnosis was by Stoll's method using 0·01 gm. of faeces, it being noted that D.C.F. is more accurate but demands a more complicated apparatus. Anaemia was [as usual] more or less proportional to faecal egg numbers (a female being represented by 12 to 44 eggs to the gram); but with frequent and noteworthy exceptions, for the first and last items in the table show 200, 3, 87·5 and 800, 6, 90 for number of eggs, millions of red cells, and percentage of haemoglobin respectively. Reticulocytes [hématies granuleuses] were present in 18, mostly in those with anaemia. As to lysins the pyramidon reaction [this *Bulletin*, 1933, Vol. 30, p. 670] is very variable, present in 50 to 60 per cent. of those with "ankylostomes." Isolysins were absent in 26, present in 1 when the man's serum was used with red cells from a normal control, and in 6 when the man's serum was used with red cells from another man with this infection. Heterolysins were present in all of 15 cases examined and in the one normal control used. Of 27 cases the red cell resistance was normal or nearly so in 12, lessened in 3 and increased in 12. Urobilinuria was present in 20 of 28 men and had no relationship to the number of eggs passed, bilirubinaemia often increased, judged by van den Bergh's indirect reaction. Jaundice appeared 6 times in 48 after the giving of carbon tetrachloride, particularly in those with slight infections as judged by worm counts. Light infections are held to be of importance for two reasons. First, there are men with these numbers of eggs per gram, red cells (in millions) and haemoglobin 200, 3, 87·5; 400, 2·94, 81; 400, 2·4, 82·5. Second, van Slype has been greatly impressed by the number of apparently healthy persons who come to him begging for the medicine to make them strong, meaning carbon tetrachloride, and they do this in spite of such deterrents as its taste and the febrile jaundice which is apt to follow it. He ends emphatically by urging that the discovery of eggs in the stool necessitates treatment, whatever their numbers. *C. L.*

LAVERGNE (J.). Le traitement de l'ankylostomiase par la méthode italienne au chloroforme-huile de ricin. [**The Chloroform-Castor Oil Treatment of Ankylostomiasis.**]—*Bull. Soc. Path. Exot.* 1935. June 12. Vol. 28. No. 6. pp. 441–443.

Chloroform-castor oil is the treatment of election for hookworms. This sweeping recommendation of an old remedy is based on 37 cases compared with oil of chenopodium in 18, there being no note of its ascaridole content, with thymol in 9 there being no mention of particulation, and of santonin in two. It was the only treatment after which worms were recovered in the stools and gave the lowest percentage of egg-containing specimens when faeces were examined by an unstated method 20 days later. Finally the author asks whether there is digestion of dead worms, a question answered in the affirmative many years ago. *C. L.*

DE FREITAS (Octavio). Frialdade e anemia tropical. [**Frialdade and Tropical Anaemia.**]—*Arch. Brasileiros de Med.* 1935. Sept. Vol. 25. No. 9. pp. 349–360.

"Frialdade" is a local popular name designating a disease brought over from Africa with the natives and characterized by a more or less

pronounced anaemia, in fact ankylostomiasis. The word itself primarily meant chilliness and so figuratively, coldness, dullness, apathy. It has several other synonyms opilação (constipation, torpor), cauçaço (lassitude), inchação (swelling, presumably oedema), amarellão (yellow, probably the pallid tint of severe anaemia), cachexia africana and others—well recognized symptoms of severe hookworm infestation. This article is a Congress paper dealing with the subject mainly from the historical aspect. *H. H. S.*

TONKING (H. D.). **Ancylostomiasis in Digo District.**—*East African Med. Jl.* 1935. Aug. Vol. 12. No. 5. pp. 149–151.

In Msambwene, a selected healthy village, there was a hookworm infection rate of 100. With the advised precautions, the eggs in 1 cc. of faeces were counted by D.C.F. [not D.C.F.F.]. The number varied from 2 to 3,800 with an average of 466 [and must have been many more], the mean haemoglobin to the Talquist scale was 60 in over 1,000 cases, and the eosinophils in 50 unselected cases 13·46. Ascaris was present in 29, trichuris in 37. [Presumably the salt solution used was a saturated one with a specific gravity of about 1,200.]

C. L.

PLUM (Denis). **Observations on Ankylostomiasis and Anaemia in Kenya, with Special Reference to the Digo and Embu Districts.**—*East African Med. Jl.* 1935. Sept. Vol. 12. No. 6. pp. 162–185. With 2 graphs. [35 refs.]

In the Msambweni Hospital, routine examinations of inhabitants of Digo District gave the following *percentages* of infection: malaria 35 of 1,690, urinary schistosomiasis 51 of 421, "ancylostomiasis" 69 of 444, the percentages in males and females being near to one another. Of the 444 faecal tests the *numbers* of persons with other infections were ascaris 308, taenia 13, trichuris 180, strongyloides 26, *S. mansoni* 13, *E. histolytica* 13, the quantity in use being "a platinum loopful of faeces, diluted when necessary with water."

The *percentage* of infection of Embu and Digo Districts, the former measured by 1,946 smears at Keruguya hospital, are very different, being respectively: hookworms 6 and 68 [or 69], ascaris 79 and 17, tapeworms 34 and 2·7, urinary schistosomiasis negligible and 50, malaria 47 and 27. The species of plasmodium in the two villages were present in nearly the same relative percentages. Tables give the effect of various treatments on eggs in the faeces and on the anaemia. [As to these, the reviewer is unable to bring himself to believe that the dosage used for carbon tetrachloride was really 40 cc. in most cases and for ascaridole up to 40 cc., so makes no reference to cure rates and regrets the use of the term ancylostomes to cover, it seems, all ankylostomes of whatever genus.] Plum's conclusions are these:—

"1. The anaemia of the Wadigo is an iron-deficiency anaemia effected chiefly by ancylostome infection of a people whose diet is deficient in iron.

"2. The cure of the mass anaemia in Digo is dependent upon a radical alteration in the dietary in addition to anthelmintic treatment and satisfactory disposal of faeces." *C. L.*

RODRIGUEZ MOLINA (R.). **Treatment of the Anemia associated with Hookworm Disease. Preliminary Report.**—*Puerto Rico Jl. Public Health & Trop. Med.* 1935. Sept. Vol. 11. No. 1. pp. 49–55. [10 refs.] [Spanish version pp. 56–62.]

A report on 5 cases showing the relative importance of iron and of deworming for the cure of anaemia in heavy hookworm infections.

This paper was read at the meeting of the Pan American Medical Association held at San Juan, Porto Rico, in March 1934. The 5 cases all passed more than 1,000 hookworms after an anthelmintic, but before this they were in hospital for 40 days during which time blood examinations were regularly made. On admission there was a microcytic hypochronic anaemia with red cells from 1·5 to 3·5 millions and haemoglobin from 4·2 to 5·3 grams (29 to 36·4 per cent.) by the Newcomer-Klett instrument which takes 14·5 grams as 100 per cent. Daily two of them received 6 gm. of iron and ammonium citrate, one 3 gm. of this, as well as a liver extract representing 350 gm. of fresh liver, one 2 gm. of the iron salt and 6 gm. of a commercial gastrohepatic concentrate, and the 5th a full hospital diet only. While in hospital all gained weight, all had a steady rise in blood values, but only to a subnormal level, that is the red cells rose to between 3·5 and 4·3 millions and the haemoglobin to between 10·6 gm. (72·9 per cent.) and 12·2 gm. (83·4 per cent.) the highest value being in one of those taking iron and ammonium citrate 6 gm., and the lowest in the man on hospital diet. The anthelmintic was 2·5 cc. of carbon tetrachloride. Within a week of taking it the red cells had risen to between 5 and 6 millions in all, in the 2 cases taking 6 gm. of iron the haemoglobin rose to 15·3 and 16·3 gm. respectively (106 and 112 per cent.), in the others it remained about 11·4 gm. (78·4 per cent.). The two cases with full iron dosage were passing eggs 3 weeks later, so that neither of them was really dewormed ; one lost blood values rapidly, the other showed further improvement in spite of this.

C. L.

TIMPANO (P.). Valore prognostico della v.di s.dei globuli rossi e dell'eosinofilia negli anchilostomiasici. [**Prognostic Value of Red Corpuscle Sedimentation and of Eosinophilia in Ankylostomiasis.**] —*Ann. d'Igiene.* 1935. Apr. Vol. 45. No. 4. pp. 263–266.

The author recorded last year the results of his investigations into the sedimentation rate of red cells in hookworm disease (see this *Bulletin*, 1935, Vol. 32, p. 267) and he now follows this by a study of the value of this test and of the degree of eosinophilia in prognosis. His findings are based on 27 patients with ankylostome infestation and 7 free but belonging to families in which there have been cases recently. An acceleration of the sedimentation rate was demonstrated so long as the infestation continued, but on removal of the cause, *i.e.*, getting rid of the hookworms, the rate again became normal. The rate increase was not proportional to the number of worms but rather to the changes set up by them, since in certain individuals a few worms may cause profound alterations in the blood while in others a heavier infestation may cause little detriment and the sedimentation rate is affected only when the infestation definitely affects the blood.

The return to normal occurs in 2–3 weeks after removal of the worms. If the rate becomes normal and worms are still in the intestine, these are presumably male. As regards eosinophilia the author makes

no fresh addition to our knowledge that the degree of eosinophilia is unrelated to the amount of infestation. [The presence or absence of hookworms was determined by "examination of the faeces," but the technique of this examination is not stated in the paper.]

H. H. S.

MAPLESTONE (P. A.) & MUKERJI (A. K.). **The Passage of Hookworms after Treatment.**—*Indian Med. Gaz.* 1935. June. Vol. 70. No. 6. pp. 320–321.

The discovery of no worm in the first stool after the taking of an efficient anthelmintic has been held to be a rough test of the need there had been for the giving of anthelmintics on a mass scale. Such a test gave in the authors' hands no demonstration that a man had been worm-free and no idea of worm numbers if he had not.

The anthelmintic in use was tetrachlorethylene 3 cc. and oil of chenopodium 1 cc. in magnesium sulphate [see this *Bulletin*, 1934, Vol. 31, p. 393]; there is no note of the strength of ascaridole in the oil. The account is of 100 infected persons. The test of cure was that no eggs were seen by D.C.F. 10 days after treatment; by this, cure took place in 73. Numbering of eggs was done on all these persons before treatment and "showed absolutely no correlation with the number of worms subsequently passed." Discovery of worms was by sieving. Of the hundred cases, no worms were seen in the first stool in 42, but 5 of these went to stool within 15 minutes of taking the anthelmintic. In 55, fewer than 20 worms in all were seen, and their discovery took place in the first stool in 28 of them; in 45, with 20 or more worms the number was 30. Details are given of all these more weighty infections. The relation between the worms seen in the first stool on the one hand and in all of them up to 3 or even 4 days on the other was at the smallest 0–360, and at the greatest 80 in 84, 234 in 252, 219 in 233, and 182 in 199. The largest figures were 748 in 1,249 but in no case may they be taken as a suggestion of the numbers of all worms harboured.

C. L.

KIRBY-SMITH (J. Lee). **The Treatment of Creeping Eruption.**—*Southern Med. Jl.* 1935. Nov. Vol. 28. No. 11. pp. 999–1004. With 16 figs. [23 refs.]

The treatment most useful in destroying the larva of *A. braziliense* in a creeping eruption is ethyl chloride freezing.

Kirby-Smith has seen 5,000 cases of creeping eruption. For prevention, in areas where the infection is common, children should not go barefoot on wet soil nor should anyone sit on this. When the lesions are simple and without septic complications the area for 1½ in. round the visible end of the burrow should be frozen for 2 to 4 minutes with ethyl chloride. A pencil of carbon dioxide snow is very painful and the vesicle heals slowly. With multiple lesions the ethyl chloride freezing should be applied only to a few at a time. If there is secondary dermatitis this must first be got rid of, for otherwise the ends of the burrows cannot certainly be seen. There is an illustration of an ethyl chloride tube whose spray is under easy control. For discussion SHELMIRE had a preference for freezing for 30 seconds only at a time to avoid superficial necrosis, but Kirby-Smith did not think this was long enough for destruction of these larvae in the epidermis. [Kirby-Smith has written "To the present day it has not been demonstrated

that man harbors this parasite." In 1913 the reviewer was the first to report the presence of the adult parasite in 3 of 30 prisoners coming to his jail from that of Mymensing, Bengal [see this *Bulletin*, 1913, Vol. 2, p. 188], and in the same year noted that it was seen in the faeces of 9·3 per cent. of 150 treated prisoners at Berhampore, Bengal [see this *Bulletin*, 1914, Vol. 3, p. 293]. AFRICA [see this *Bulletin*, 1932, Vol. 29, p. 862] has collected many instances of this infection in man, and SHELMIRE in the discussion reported the probable occurrence of another case.] *C. L.*

MALDONADO SAMPEDRO (M.). La lucha contra la anquilostomiasis en la Sociedad de Peñarroya (1928–1932). [**Hookworm Campaign in the Peñarroya Company's Mines.**]—*Medicina Países Cálidos* Madrid. 1935. Aug. Vol. 8. No. 8. pp. 361–384. With 11 figs.

These mines are situated in Spain, in the Province of Córdoba, Cuidad Real and Jaén. Among 1,762 men employed in 17 mines, 893 or 50·6 per cent. were infested with hookworm. In this article records in more detail are given for two mines in Córdoba, *viz.* El Antolín and San Rafael. At the former in an examination made in 1925 of 378 persons examined 234 or 61·8 per cent. and at the latter 243 among 311 or 78·1 per cent. were positive. In another table dealing with more recent figures of 995 examined at El Antolín 420 or 42·2 per cent. were positive, the greatest degree of infestation being 53·7 among 196 between 25 and 34 years of age, those between 25 and 29 having almost the same, 53·8, as those of 30 to 34 years of age, 53·6 per cent. At San Rafael of 456 examined 257 or 56·3 per cent. were positive, among those aged 20–24 years 46 were positive out of 56 (*i.e.* 82·1 per cent.), the next being between 30 and 34 years among 71 of whom 42 or 58·8 per cent. were positive.

As regards other helminth infestations, at El Antolín among the same number (995) 52 harboured Trichuris (5·2 per cent.) and 23 or 2·3 per cent. *Hymenolepis nana*, 11 or 1·1 had Enterobius. At St. Rafael 42 or 9·2 per cent. harboured Trichuris, 16 or 3·5 *H. nana* and 7 or 1·5 per cent. Enterobius. [In none of these is the method of examination stated; it was probably by direct smear.]

For treatment, at first chloroform and castor oil were given, later oil of chenopodium, and carbon tetrachloride were the chief drugs used, and of a total of 1,218 miners treated 1,182 were cured, a 97 per cent. success. Oil of chenopodium proved the most satisfactory; it was given before any food in the morning in a single dose of 1·8 gm. in gelatine capsules, and was followed 45 minutes later by 30 gm. of sulphate of magnesium. The patients were advised to take no food during the forenoon and to abstain from alcohol in any form during that day. *H. H. S.*

ARAR (Asim). Les résultats de la lutte contre l'ankylostomiase dans la province de Rizé (actuellement Tchorouk) en Turquie. [**The Hookworm Campaign in Rizé Province, Turkey.**]—*Bull. Office Internat. d'Hyg. Publique.* 1935. Sept. Vol. 27. No. 9. pp. 1774–1778.

This campaign against the hookworm has now covered 138,468 sick.

This paper is a continuation of that already noted [this *Bulletin*, 1932, Vol. 29, p. 420].

The gross clinical signs of ankylostomiasis were anaemia with red cells down to 700,000 and haemoglobin to 10 and an eosinophilia up to 35. The incidence to Stoll's technique is from 20 to 67 per cent. [so must in fact be considerably higher]. Carbon tetrachloride is a better anthelmintic than chenopodium, tetrachlorethylene, or hexylresorcinol. Its adult dose was 2 cc. and it has apparently been given without fatality [at least none is mentioned] and signs of intolerance were, as if by magic, no longer to be seen after sulphate of soda (Na_2SO_4) was given in place of sulphate of magnesia ($MgSO_4$). Second and third treatments were given when faecal testing showed that eggs were still present, and the percentage of infection [determined as above] has fallen from 50 to 8 after 3 treatments. Sanitation seems limited to leaving faeces in pits, for decomposition to do its work. The parasite is named as *Necator americanus*. *C. L.*

FOSTER (A. O.). **The Immunity of Dogs to** *Ancylostoma caninum*.—*Amer. Jl. Hyg.* 1935. July. Vol. 22. No. 1. pp. 65–105. With 7 graphs. [11 refs.]

A dog's general condition is an important point in the prevention of hookworm infection. If this is good its resistance to infection is greater.

An earlier infection had no certain effect in the prevention of a test one, since in 2 experiments resistance was greater and in 3 was less. To free a dog of infection before giving it a test infection did not have an effect on the test infection. In other experiments light hookworm loads seemed to lead to a better resistance; but 12 died of acute hookworm disease after repeated infection, so that the belief is that with a heavy infection there may be predisposition to further infection. Age resistance was poor in an ill-nourished litter.

C. L.

FOSTER (A. O.). **Further Observations on Prenatal Hookworm Infection of Dogs.**—*Jl. Parasitology.* 1935. Aug. Vol. 21. No. 4. pp. 302–308. [27 refs.]

"The administration *per os* of single doses of infective larvae of *A. caninum* to three pregnant bitches at intervals of 5, 9, and 32 days, respectively, before parturition (gestation normally 63 days) resulted in prenatal hookworm infestations in all but one of twenty-one puppies. Although the mothers were very resistant to hookworms, the puppies did not appear to be protected on this account. One litter of five pups was prenatally infected with the "cat strain" of *A. caninum* as a result of administering larvae to the mother only two days before birth of the puppies. It is suggested that the occurrence of prenatal infection with parasite worms may be of economic and public health importance."

C. L.

FAUST (Ernest Carroll). **Experimental Studies on Human and Primate Species of Strongyloides. IV. The Pathology of Strongyloides Infection.**—*Arch. Pathology.* 1935. June. Vol. 19. No. 6. pp. 769–806. With 16 figs. [26 refs.]

For the last study see this *Bulletin*, 1935, Vol. 32, p. 235. The scope of this one is shown in its title.

On account of the different views in the literature, 62 dogs were given infection with a strain of strongyloides from man and kept

under controlled conditions till they were killed or died. The skin lesions were unimportant. There was damage to the lungs in 29 per cent.—haemorrhage, alveolar ruptures, exudation of leucocytes into the air passages. This last is held to be bad for the host, because it imprisons larvae so that there is growth of them in the bronchi to full development with invasion of the palisade epithelium and birth there of young. But when there has been carriage of larvae to the digestive canal they form similar tunnels through the crypts into the stroma of the mucosa, mostly in the duodenum and jejunum but in addition in the stomach and even the rectum. In these tunnels there is oviposition and hatching, and the larvae make their escape into the lumen of the intestine. "Thus both mechanical and lytic damage is produced, at times effecting a honeycombing of the depths of the mucosa frequently associated with hyperplastic tips or even extensive sloughing of the entire area evolved." The tissue reaction to the worms is encapsulation with phagocytosis by epithelioid cells. "Larvae attempting to invade the muscularis mucosae are immediately surrounded by an infiltration of cells resembling a pseudo-tubercle. Extensively damaged tissue in any zone is subject to fibroblastic repair. In all of these local actions eosinophils are conspicuously absent." *C. L.*

BEACH (Ted de Vinne). **Experimental Propagation of Strongyloides in Culture.**—*Proc. Soc. Experim. Biol. & Med.* 1935. June. Vol. 32. No. 9. pp. 1484–1486.

"So far as is known this is the first demonstration of continued propagation" of the free-living phase of any species of *Strongyloides*. The form was *S. simiae* of New World monkeys; the culture medium was filtered nutrient agar 2 gm. extract in water of monkey faeces 25 cc., distilled water 25 cc. The belief is that males of the third generation were present. *C. L.*

VALCKE (G.). Traitement de l'anguillulose par une cure combinée d'émétique et de violet de gentiane. [**Treatment of Strongyloides Infestation by Tartar Emetic and Gentian Violet.**]—*Ann. Soc. Belge de Méd. Trop.* 1935. Sept. 30. Vol. 15. No. 3. pp. 387–390.

With treatment and while under observation the stools became negative and the health good in 3 cases, in the fourth there were no such results. In the last, treatment was gentian violet 0·06 gm. three times a day for a week, in the others 0·1 gm. with tartar emetic. Eosinophilia was marked. *C. L.*

CHANDLER (Asa C.). **Studies on the Nature of Immunity to Intestinal Helminths. I. The Local Nature of the Immunity of White Rats to Nippostrongylus Infection. II. A Study of the Correlation between Degree of Resistance of White Rats to *Nippostrongylus* and Interval between Infections.**—*Amer. Jl. Hyg.* 1935. July. Vol. 22. No. 1. pp. 157–168; pp. 243–256. With 1 graph.

So far as they seem to apply to man the conclusions may be put as these—no active immunity against these parasites is got by injection of serum of parasitized rats and that in "parabiotic twins" any

active immunity of one, got by injections of worms, is not present in its "twin" though there was good intermingling of blood. So the belief is that immunity is local in the mucosa, perhaps nutritional and possibly anti-enzyme in nature and may be a very widespread phenomenon. The tardy arrival of larvae in the intestines after 3 or 4 infections is not due to intestinal immunity but perhaps to some reaction of cells in the lungs and air tubes. *C. L.*

HEADLEE (William Hugh). **Studies on Infections of Human Parasitic Worms under Institutional Conditions.**—*Jl. Lab. & Clin. Med.* 1935. July. Vol. 20. No. 10. pp. 1069–1077. [11 refs.]

Using the smear, Willis's floatation method, and perianal scraping, only one kind of infection, *Enterobius vermicularis*, was found in 876 examinations on 652 patients in a mental hospital in Illinois.

In 89 examinations by faecal smear no eggs were found, in 505 by Willis's technique 3·37 were positive, in 282 by perianal scraping 21·99 per cent. were positive. Under the heading "Institutional Environment and Helminthic Infections" Headlee points out the cleanliness of the whole premises and surroundings and the fact that there is no previous examination on which to go in making up one's mind on the question of the way of carriage of this infection in the Institution, and in doing so makes this statement "Lane (1913) in reporting on the infections in prisons and jails of Bengal, regards the possibility of infection in a jail as nonexistent." [The title of Lane's paper is "Ankylostomes and Ankylostomiasis in Bengal," and the title is the measure of its scope.] *C. L.*

LENTZE (Friedrich-August). Zur Biologie des *Oxyuris vermicularis.* [**The Biology of** *Enterobius vermicularis.*]—*Zent. f. Bakt.* I. Abt. Orig. 1935. Vol. 135. No. 1/3. Beiheft pp. 156–159. With 1 fig.

More consideration should be given to the air as a means of the carriage of Enterobius infection or reinfection.

Carriage of this infection has taken place where the greatest care has been used in the washing of hands and in the arrangement of night clothes so that eggs cannot be carried from anus to mouth by the hands. Again for development the threadworm egg must come in contact with acid at one stage in its development. Yet this infection has persisted when all care has been taken for the prevention of hand-to-mouth carriage of eggs, so that the suggestion has been made that contrary to the instinct which takes the females down to the rectum and out of the anus to oviposit, another one or reversed peristalsis takes them up to parts of the small intestine where the reaction is acid, and that there they make a stay of at least 6 hours—an unlikely thing to happen. Accordingly Lentze made tests of the possibility of carriage by air. A cardboard cylinder 80 cm. long and 20 cm. wide (about 31 and 8 inches) had, while kept vertical, placed in its upper part folds of a torn nightgown on which eggs of this worm had been placed and two folds of which had been rubbed together. This cylinder he shook with the enclosed cloth at about the level of his head, set it down on a glass plate, took away the cloth and covered the top of the cylinder with a piece of cardboard. The tests were of two sorts. He replaced the glass under the cylinder with a new

one, 30 seconds, 1, 2 and 5 minutes after the cloth had been taken out, and he washed out his nose. The eggs were first found on the glass at the bottom 2 minutes after the infected cloth was removed, that is to say their passage through 70 to 80 cm. of air took 2 minutes. In the washings from his nose 2 eggs were seen. He had shown already that these eggs pass through the meshes of material unless this is closely woven. His belief then is that movements of an infected person in his night clothes or bed clothes carry threadworm eggs in eddies of air to a position where they are inhaled and that they reach the stomach by active wandering or by being swallowed. His view is that the usual anal ointments soothe itching mechanically but make it easy for the females to get to the outside through the anus.

C. L.

PENSO (Giuseppe). Il ciclo di sviluppo degli Ossiuri. Sua importanza in medicina pratica. [**The Development of Enterobius ; its Importance in guiding Treatment.**]—*Policlinico.* Sez. Prat. 1935. Oct. 7. Vol. 42. No. 40. pp. 1943–1946, 1949. With 1 fig.

The hypothesis is put forward that present ideas on the development of Enterobius are wrong, that the fertile female makes her way into the intestinal wall and there oviposits, larvae hatch and make a passage into the lumen where there is growth to the adult stage. In this way is explained the absence of eggs from the faeces, while as to larvae there is some hiding place for them. Treatment based on this hypothesis is detailed. [It is a fact that passage of pregnant female oxyurids *per anum* (that is from the lumen of the intestine) is a commonplace and that in favourable conditions they may there be seen ovipositing on a microscope slide.] *C. L.*

NOLF (L. O.) & EDNEY (J. M.). **Minimum Time required by** *Trichinella spiralis* **to produce Infective Larvae.**—*Jl. Parasitology.* 1935. Aug. Vol. 21. No. 4. pp. 313–314.

In a series of rats fed by stomach tube with 5,000 trichinae, encysted larvae were first seen in the diaphragm on the 17th day and were at that time infective to other rats. *C. L.*

GOLDWATER (Leonard J.), STEINBERG (Israel), MOST (Harry) & CONNERY (Joseph E.). **Hemoptysis in Trichiniasis.**—*New England Jl. of Med.* 1935. Oct. 31. Vol. 213. No. 18. pp. 849–851. [Summary appears also in *Bulletin of Hygiene.*]

Pulmonary signs or symptoms occur in half the cases of trichiniasis, but that haemoptysis also occurs, though it has been reported and indeed produced experimentally, is not generally known, and the fact is not mentioned in text-books of medicine nor does trichiniasis as a rule enter into discussion of the causes of haemoptysis or in the diagnosis of pulmonary tuberculosis. Hence the recording of these three cases is amply justified. The symptoms and history were typical in all and the presence of trichinella was proved by biopsy in one, and high eosinophilia in all, over 30 per cent. In each case the haemoptysis was a fairly late symptom, 23 days after ingestion of the incriminated pork and about 21 after the initial symptoms.

Trichinella was not found in the expectoration which was examined in two cases. ASKANAZY in his experimental work found them embolized in the lungs and FROTHINGHAM nearly 30 years ago reported finding them at autopsy in the haemorrhagic areas of the lungs of a patient dying with trichiniasis. *H. H. S.*

SPINK (Wesley W.). **Cardiovascular Complications of Trichinosis.**—*Arch. Intern. Med.* 1935. Aug. Vol. 56. No. 2. pp. 238–249. With 4 figs. [21 refs.]

"Acute myocarditis occurring in trichinosis may be a nonspecific inflammatory reaction due to the invasion of the myocardium by larvae.

"A review of the literature shows that other cardiovascular manifestations include congestion and hemorrhage of the eyes, lungs and gastrointestinal tract; edema; thrombosis; embolism with infarction, and hypotension.

"Six of eighteen cases of trichinosis (33·3 per cent.) showed electrocardiographic changes. These changes included an initial flattening or inversion of the T wave, especially in lead II, the wave subsequently becoming upright; low amplitude of the QRS complex, and intraventricular block.

"The postmortem changes in a fatal case of trichinosis with myocarditis are presented. Another case is recorded in which trichinosis was complicated by a permanent right hemiplegia." *C. L.*

THEILER (Hans), AUGUSTINE (Donald L.) & SPINK (Wesley W.). **On the Persistence of Eosinophilia, and on Immune Reactions in Human Trichinosis, Several Years after Recovery.**—*Parasitology.* 1935. July. Vol. 27. No. 3. pp. 345–354. [28 refs.]

The results of differential counts, precipitin tests and skin reactions 4 to 9 years after recovery from trichinosis.

The antigen was diluted to 1 in 10,000 in terms of dry powder, and the injection was of 0·1 cc. of this in alkaline phenolized salt solution, the control injection being by an equal quantity of the extracting fluid (Coca's solution). In the precipitin test 0·2 cc. of serum was overlaid by 0·2 cc. of 1 per cent. dilution of Trichinella extract. Of the skin reactions 2 were negative and 5 positive, of precipitation reactions 2 were negative (the same as were negative to skin test) 4 were positive by flocculation with no definite ring, and in 1 the serum was cloudy. In 6 in which it was tested the eosinophilia was 0, 5, 5, 2, 2, 7. *C. L.*

WANTLAND (W. W.). **Effect of Irradiated Ergosterol and Calcium Lactate on Calcification of Trichina Cysts.**—*Proc. Soc. Experim. Biol. & Med.* 1934. Dec. Vol. 32. No. 3. pp. 438–444. With 6 figs.

The treatment of trichinosed rabbits with these substances is of value.

The optimum dose of irradiated ergosterol is 30 to 60 drops every other day. With it there is as much calcification after 3 months as there is normally in 9 months, and the physical state of the treated was better than that of the untreated. Yet the animals may be given too much with death from calcium rigor, the symptoms being quick pulse, great weakness and dyspnoea. *C. L.*

TRAWIŃSKI (A.). Studien ueber Immunität bei Trichinose. [**Immunity to Trichinella Infection.**]—*Zent. f. Bakt.* I. Abt. Orig. 1935. June 14. Vol. 134. No. 3/4. pp. 145–149. [20 refs.]

The serum of rats which 25 to 35 days earlier have been in receipt of a heavy trichina infection is a strong preventive of infection in rabbits. *C. L.*

HU (Stephen M. K.). **Preliminary Observations on the Longevity of Infective Larvae of** *Wuchereria bancrofti* **Cobbold in** *Culex pipiens* **var.** *pallens* **Coquillett.**—*Chinese Med. Jl.* 1935. June. Vol. 49. No. 6. pp. 529–536.

This work carries on that of Hu and YEN [this *Bulletin*, 1935, Vol. 32, p. 646] and gives proof that living infective larvae were present in this mosquito 79 days after infection, the time at which the last of the test batch lot was put to death.

Between 10 p.m. and 11 p.m. mosquitoes had a blood meal from a man in whose blood 69 and 62 microfilariae were present in every 20 cmm. at those hours; 22 mosquitoes were put to death between day 10 and day 93. Mosquitoes with heavy infections have lived for a considerable length of time. After a blood meal there was development of infective larvae of *W. bancrofti* in *Culex pipiens pallens* and of *Dirofilaria immitis* in *Anopheles punctipennis*. Repeated infections may take place. *C. L.*

KARAMCHANDANI (P. V.). **The Effect of Heat and Atmospheric Humidity on all Stages of** *Culex fatigans.*—*Records of the Malaria Survey of India.* 1935. Mar. Vol. 5. No. 1. pp. 23–38. With 7 charts & 3 figs.

The author has determined in the laboratory what temperatures are fatal to *Culex fatigans* at all stages of its development.

No comparative study of the lethal temperature for each stage in the life-cycle of an insect has previously been made. The author finds that the lethal range is sharply defined in each case. The eggs all hatched at and below 39·8°C.; above this temperature, none hatched. For larvae exposed for one hour, the fatal range was 36°–38°C.; at 37°C., 50 per cent. died. Pupae were more resistant, with a range from 38°–40°C. In the case of adults exposed for one hour, the fatal temperature was lower in dry air than in moist: 37·4°C. at 0 per cent. relative humidity, 39°C. at 90 per cent. in the females; and about a degree lower in each case for the males. This adverse effect of dry air is attributed to desiccation; he produces some evidence that the males cannot conserve water so well as females. The results are all tested statistically. *V. B. Wigglesworth.*

HU (S. M. K.). **Studies on the Susceptibility of Shanghai Mosquitoes to Experimental Infection with** *Wuchereria bancrofti* **Cobbold. I.**—*Aëdes albopictus* **Skuse. II.**—*Armigeres obturbans* **Walker.**—*Peking Nat. Hist. Bull.* Peiping. 1935. June. Vol. 9. Pt. 4. pp. 249–260. [18 refs.] [Summarized in *Rev. Applied Entom.* Ser. B. 1935. Sept. Vol. 23. Pt. 9. p. 213.]

"In these experiments carried out in Shanghai during 1933–34, reared adults of *Aëdes albopictus*, Skuse, and *Armigeres obturbans*, Wlk., were allowed to feed once for one hour on a person heavily infected with *Filaria*

(*Wuchereria*) *bancrofti* and were dissected not less than 5 and usually more than 10 days later.

"The following is taken from the author's summaries: Of 62 *A. albopictus* fed, 48 contained dead immature forms in the thorax and abdomen, 4 of which had undergone chitinous encapsulation. Of 102 *A. obturbans*, 81 contained dead microfilariae in the thorax and abdomen, most of which were chitinised; 11 contained chitinised encapsulated larvae of the 'sausage' form. Filarial larvae developed to the infective stage in *Culex pipiens*, L., fed at the same time on the same case. Dissections of 383 examples of *A. obturbans* and 27 of *Aëdes albopictus* collected during 1933 from houses in the Woosung area revealed no filariae, although examples of *C. pipiens* from some of the houses were infected."

FENG (Lan-Chou). **Intermediate Hosts of** *Microfilaria malayi* **in Chekiang, China.**—*Proc. Soc. Experim. Biol. & Med.* 1934. Dec. Vol. 32. No. 3. pp. 494–496.

The best host for larval development of *Filaria malayi* was, in these tests, *Anopheles hyrcanus sinensis*.

In *A. h. sinensis*, larvae became infective on the 6th day at temperatures of 29° to 32°C.; of 44 given infective feeds and still living on that day, 30 were harbouring infective filariae; and in 14 of them their habitat was the labium. In *M.* (*Mansonioides*) *uniformis* only a small number came to full development, most becoming granular and degenerated on the 5th day. In 3 other mosquitoes, common and blood-suckers, namely *Culex pipiens*, *Aëdes albopictus* and *Armigeres obturans*, microfilariae did not go to full larval development.

C. L.

FENG (L. C.) & YAO (K. F.). **Observations on Filariasis in Huchow, Chekiang, China.**—*Chinese Med. Jl.* 1935. Aug. Vol. 49. No. 8. pp. 797–801. With 1 map.

"1. Of 2112 patients admitted to the Huchow General Hospital in Huchow, Chekiang, from October 1932 to August 1933, 44 or 2·08 per cent. were positive for microfilariae in their blood.

"2. Of the 44 positive cases, 38 showed infection with *Microfilaria malayi*, 2 with *Microfilaria bancrofti* and 4 were mixed infections.

"3. Light infection with *Microfilaria malayi* in patients whose physical conditions were healthy and whose sleeping habits were normal, showed a definite nocturnal periodicity. In one heavily infected, tuberculous (pulmonary) case who was very much debilitated and whose sleeping habit had been irregular for 2 months, microfilariae were found all the time in the peripheral blood.

"4. The distribution of the two types of filarial infection in the Chekiang-Kiangsu border is discussed."

C. L.

SCHEEPE (F. L.). De verspreiding der Filariasis in Indragiri (Residentie Riouw en Onderhoorigheden). [**The Spread of Filariasis in Indragiri (Sumatra).**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1935. July 22. Vol. 75. No. 15. pp. 1197–1201. With 1 plate.

Indragiri is situated in the middle of Sumatra and possesses a total population of about 50,000, dwelling for the most part along the river. The author began his investigation in 1930 and proceded to determine the number of filaria carriers kampong by kampong. He also used the abundant material of two estate hospitals. A total of 5,519 persons were examined from the high lands of Indragiri. Night blood

alone was examined, with the result that 990, about 18 per cent., proved to be positive carriers of the *Microfilaria malayi* described by Brug. These carriers showed manifest elephantiasis in 80 cases. An examination, however, of the night blood of 43 persons with enlarged limbs furnished only four positive microfilaria carriers. Abscesses and infiltrations were met with in 18 out of 70 microfilaria carriers who were free from elephantiasis, but the microfilaria itself was never found in the pus. The two chief mosquito species met with were *Taeniorhynchus annulipes* and *T. uniformis* of which the former was much the commoner type. Treatment is only symptomatic.

W. F. Harvey.

SNIJDERS (E. P.). Over een geval van filariasis. [**A Case of Filariasis.**] —*Nederl. Tijdschr. v. Geneesk.* 1935. June 22. Vol. 79. No. 25. pp. 3024–3030. With 7 figs. on 1 plate.

A straightforward case of filariasis is here used in a clinical lecture to illustrate certain points of the disease. The patient, a man of 32 years of age, was in apparently good health, and due to return to his work in the Belgian Congo. He had no organic disease and no Wassermann reaction, but showed an occasional albuminuria and a 54 per cent. eosinophilia. There were no casts in the urine, no increase of blood urea and nothing to note as regards heightened blood pressure. Only the two symptoms remained, together with the locality of his work, to point to a possible cause. Examination of the faeces showed no eggs, no larvae and no proglottides. There remained to be excluded schistosomiasis. An examination of the day blood provided a definite diagnosis, for there were shown to be present *Microfilaria loa* and *Microfilaria perstans*. The method of examination was to add ½ to 1 cc. blood to 10 cc. of a solution with the composition :—Sod. citrate 300 mgm. ; saponin 100 mgm. ; normal salt solution 100 cc. In this the erythrocytes are haemolyzed and the microfilariae brought down in sediment by centrifugation.

A discussion follows on the cause of albuminuria, which was obviously not dependent on a kidney lesion. The explanation offered is that this may be due to the formation of " Calabar-swellings " in the capsule of the kidney or the bladder wall.

What decision was to be made about allowing the man to return to his work ? He had already spent 11 years in the Congo, was therefore experienced in the dangers of the life there. Moreover the probabilities of his being infected in this region, even had he had no infection already, were high, for this is placed at 90 per cent. It was useless attempting to cure the condition and the condition is known sometimes to cure itself with time. On these grounds then there seemed no reason to refuse the man permission to return to his work.

W. F. H.

DE AMICIS (Arturo). Un caso autoctono di filariasi da " Filaria Bancrofti " osservato in Italia. [**An Indigenous Case of Filariasis bancrofti in Italy.**]—*Giorn. Ital. di Malat. Esot. e Trop.* 1935. July 31. Vol. 8. No. 7. pp. 167–169. With 2 figs.

The author records the case of a peasant aged 27, a native of Gambabesa, Campobasso [in the Apennines, north-east of Naples], who was suffering from elephantiasis of the genitalia with lymph

scrotum, hydrocele and slight chyluria. Bodies believed to be embryos of *F. bancrofti* were found in the urine and in the blood by day as well as by night. The patient had never visited the tropics, had not even been away from his native country. *H. H. S.*

[The bodies in the microphoto purporting to be microfilariae in the blood correspond to these neither in details nor proportions.—*C.L.*]

WRIGHT (R. E.), SEETHARAMA IYER (P. V.) & PANDIT (C. G.). **Description of an Adult Filaria (Male) removed from the Anterior Chamber of the Eye of Man.**—*Indian Jl. Med. Res.* 1935. July. Vol. 23. No. 1. pp. 199–203.

"The worm . . . agrees in its morphological features with the previous descriptions of the male of *W. bancrofti* except as regards a few minor details which would not appear to be of specific importance."

The details of the case were given by WRIGHT [this *Bulletin*, 1935, Vol. 32, p. 474]. The description of the worm would have been clarified by camera lucida drawings. *C. L.*

KHALIL Bey (M.). **The Aetiological Rôle of Filariasis in Endemic Funiculitis and Hydrocele in Egypt.**—*Jl. Egyptian Med. Assoc.* 1935. June. Vol. 18. No. 6. pp. 389–395. [14 refs.]

A survey in Kafr Ghatati, a village 14 km. west of Cairo on the edge of the desert, with endemic filariasis.

The blood of 958 of the 1,038 persons living there was taken between 9 p.m. and midnight. *Mf. bancrofti* was present in 26·5 per cent. (28·6 in males, 24·4 per cent. females); hydrocele in 25·7 per cent. of 475 males, the percentage of microfilariae in these being 24, as against one of 30·3 per cent. in those who had no hydrocele. Thickening of the spermatic cord was present without hydrocele. *C. L.*

MONTESTRUC (E.) & BERTRAND (Ch.). A propos d'un cas de lymphangite tropicale. [**Tropical Lymphangitis.**]—*Bull. Soc. Path. Exot.* 1935. July 10. Vol. 28. No. 7. pp. 612–614.

A large plaque of lymphangitis [? lymphatic oedema] on the antero-internal aspect of the thigh suppurated, was opened, and let out half a glass [? some 5 oz.] of pus containing streptococci. [The attention of readers of the *Bulletin* is called to this, because there is often a tendency to regard all elephantoid conditions in a filarial district as due to the helminthic infestation.—Ed.] *C. L.*

MENON (T. Bhaskara). **Maharaja of Travancore Curzon Lectures (University of Madras) (1934–1935). Problems in Filariasis. With a Foreword by** Major-General Sir Frank Powell CONNOR, Kt., D.S.O., K.H.S., F.R.C.S., I.M.S., Surgeon-General with the Government of Madras.—pp. ii + 67. With 22 figs. (1 coloured) on 16 plates. [107 refs.] 1935. Madras: Printed by Thompson & Co., Ltd. [Re. 1.]

In these 3 lectures the note on which Menon makes his start and his end, and to which his attention is frequently given between, is

that there are many spaces in our knowledge of Bancroftian filariasis. These he clearly points out, as well as the need for accurate and co-ordinated study before the spaces are full.

Lecture I.—Though elephantiasis arabum is such a common name the first description of the disease, and a good one, comes from India by SUSHRUTA in the Vedic and Brahminic periods of 600 B.C. After historic observations, such as MANSON'S suggestion that the infective larva escaped from the mosquito into water and was drunk, attention is given to the endemiology namely "small circumscribed foci . . . where the infection rate is very high, but neighbouring areas with very similar climatic conditions show only a lower incidence." Menon is in doubt as to the whole explanation being that physical conditions of heat and moisture of air are or are not right for the development of the larva in the mosquito and its transmission to man, and makes the suggestion that many of the facts now hard of explanation become easy if there were discovery that the infective larva can effect entry of the skin from water. Explanation is needed of the different clinical types of disease met with in different areas; is it one of different parts of the skin being used as the place of entry in different areas, or is it ascribable to different species of worm, or to different degrees of infection, or to the use of different lines of passage in the body? Though the discovery of clinical signs is largely dependent on the doctor's acuteness, "symptomless filariasis" is probably the result of a slight infection, and elephantiasis the end result of long and wide lymphatic blockage. Stress is laid on a gap of knowledge in the life-cycle—What happens to the infective larvae after they enter man? How do they, as so many do, get to the scrotum?

Lecture II is on the problem of microfilarial periodicity. Menon adds a little to the evidence that female worms in the same host are in the same stage of microfilarial development and that in one case microfilariae were absent from the uterus when the worms were removed at 2 p.m. "On the whole, Lane's theory rests on the demonstration of a burial ground where the microfilarial brood in the blood are disposed of every day. This has got to be carried out." [The reviewer suggests again that primarily the theory rests on the evidence for or against simultaneous daily parturition in the female worms. When workers are satisfied as to this, then and only then will they begin an adequate search for the site and means of destruction of microfilariae.] The point is next raised whether parturition is after all a daily event, but may not be the cause of the periodic attacks of filarial fever? What is the stimulus which produces cyclical parturition [or indeed periodicity if this is not due to parturition]? It is significant that in the year 1935 it should be possible for Menon to say rightly "on the whole, histological studies of the lymphatic glands are so few, that it is not possible to decide whether the changes could be directly attributed to toxic and foreign body reactions round the parent worms [or microfilariae] or . . . to a toxic discharge from the worms lying at some distance" or as ACTON and RAO suggest to passage of infective larvae.

Lecture III.—(1) The pathology of elephantiasis including mention of the effects of the injection of sclerosing fluids by HOMANS, DRINKER and FIELD showing the effects of the mechanical factor and of secondary infections. (2) Methods of diagnosis, including the measured drop, the intradermal reaction interfered with in India by present difficulty in getting the antigen, X-rays in which radiograms are correlated with

the results of sectioning, and the adhesion phenomena of PANDIT, PANDIT and IYER. (3) Treatment, of a general vermicidal character which has proved disappointing, by local injection of sulpharsphenamine, and by operation. The last section urges the great need for further accurate and co-ordinated studies, which at last this great subject will evidently receive. *C. L.*

i. DRINKER (Cecil K.), AUGUSTINE (Donald L.) & LEIGH (Octa C.). **On Filtration of Microfilariae by Lymph Nodes.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1935. June 29. Vol. 29. No. 1. pp. 51–58. With 3 figs.

ii. KNOTT (James). **The Periodicity of the Microfilaria of** *Wuchereria bancrofti*. **Preliminary Report of Some Injection Experiments.**—*Ibid.* pp. 59–64.

iii. LANE (Clayton). **A Note on Periodic Bancroftian Filariasis.**—*Ibid.* July 31. No. 2. pp. 135–142. [16 refs.]

i. *Microfilaria immitis* passes through lymph glands of the dog with comparatively slight hindrance and without phagocytic infiltration of the glands. *Mf. loa* though sheathed travels on a slide faster than the unsheathed *Mf. immitis*. By analogy *Mf. bancrofti* will not measurably be impeded by lymph glands and if mechanically checked in them will not suffer thereby.

Mf. immitis, collected by centrifuging heparinized and haemolysed blood of an infected dog, were resuspended in a mixture of dog serum and normal saline such that the protein content lay between 1·2 and 2·3 per cent., figures normal for the leg lymph of the dog. With precaution for maintenance of its evenness, this suspension was run into the lymph afferent of the popliteal gland of a dog. The outcoming lymph was collected either by cannulation of the efferent lymphatic of this gland or of the thoracic duct. A typical experiment of each sort is detailed in two tables, these show that when 16,141 larvae were run into the popliteal gland during 85 minutes, 125 reached the outgoing vessel and 16,016 did not. Again when 88,252 were run into this gland of another dog during 114 minutes, 1,400 reached the thoracic duct and 86,852 did not. In these last experiments the perfusate was coloured with trypan blue, which had no observable effect on the activity of the embryos. It thoroughly stained both popliteal and iliac glands, and it and embryos appeared in the thoracic lymph at the same time. There was, then, passage of the perfusate through both structures. In entire cross sections of perfused glands 8 μ thick, there were small numbers of embryos, mostly in intermediary sinuses and with evidence of reaction in no case. In 3 experiments microfilariae were imprisoned in the popliteal gland by ligature of the outgoing vessel. "The microfilariae survived this treatment with great success . . . We cannot at present furnish any estimate as to the number that may have escaped from the node by migrating . . . In none of these instances of imprisonment [which reached to 5 days] . . . was there the slightest evidence of phagocytosis." As to motility, paths of travel on a slide plotted out for the unsheathed *Mf. immitis* showed progress of 0·18, 0·16, 0·19, and 0·14 mm. per minute, the blood coming from a heparinized dog; and for the sheathed *Mf. loa* 0·37 mm. "One larva has penetrated the vaseline with the anterior third of its body directed into the vaseline. . . . These observations

show beyond possible question that sheathed microfilariae are capable not only of movement but also of actual travel, and that their travel is forcible as indicated by the organism which penetrated the vaseline. . . . It is reasonable to believe that the ease with which [Dirofilaria] traverses lymph nodes would be equalled by *Loa*," and that the embryos of *Wuchereria* would be expected to pass to the blood stream as readily as those of *Loa* with " no serious check in passing through lymph nodes." Further experiments with *Mf. immitis* are in progress.

C. L.

ii. " (1) A series of experiments is reported in which blood containing microfilariae was injected into non-filarial human subjects.

" (2) A method of blood examination for microfilaria is described.

" (3) Microfilariae were found to have great difficulty in passing through the peripheral capillaries.

" (4) Microfilariae are less active in day blood than in night blood. It is suggested that because of this, they are not able to work their way through the capillaries in the daytime, hence the mechanism of nocturnal periodicity.

" (5) In one subject the injected microfilariae lived 14 days and observed typical nocturnal periodicity.

" (6) In another subject who showed clinical signs of filariasis, the injected microfilariae (which were injected into the brachial artery) never passed through the peripheral capillaries. This suggests an acquired resistance to the parasites, and that in an immune patient the microfilariae are stopped in the capillaries and perish there.

" (7) In a subject showing elephantiasis the microfilariae survived only 2½ days."

iii. Clayton Lane deals with the chief points in the two preceding papers and with other matters relative to this important and interesting question—the periodic appearance of embryos of *W. bancrofti* in the peripheral blood.

The author considers first the optimum habitat of the adult filariae, as shown by examination of " focal spots," places which are painful during an attack of elephantoid fever or of lymphangitis in infected persons. Some of these " spots " when examined after excision contain calcified worms. O'Connor has related that three-fourths of the filariae were in the periglandular lymph vessels or in the capsule or cortical sinuses of the glands (see also this *Bulletin*, Vol. 29, pp. 427, 765). Romiti's view that if adult worms are found outside the sex organs they have arrived there after death is discussed and shown to be erroneous by a concrete example to the contrary and one positive must outweigh theoretical negatives.

The author does much to clarify the difficulty by his simile of two escalators, the lymph and the blood, fronting an infective larva after it has penetrated the human skin. If it chooses the former it may be brought to a stop somewhere in the slow lymph current in arm, thigh, leg, or a lymph gland, and there grow to an adult. If it elects for the latter it is carried by the circulation to a " suitable " capillary (a term not definable at present), passes through the vessel wall into a lymphatic in the tissues and there develops. If it does not penetrate the capillary wall it passes on in the blood stream till it either finds a resting place for development or dies.

After birth in the lymph embryos reach the blood by the ordinary route of the circulation or by taking a short cut through the walls

of the lymph and blood vessels. The weight of evidence is against the embryos passing through a lymph gland and in favour of their "by passing" the gland itself by the use of the new collateral lymph vessels which form in these cases.

DRINKER, AUGUSTINE and LEIGH have argued that embryos of *Dirofilaria immitis* pass easily through the lymph nodes and that "by analogy" those of *W. bancrofti* will do the same, but Clayton Lane shows that their own figures do not bear out the former and that arguments by analogy are not valid evidence, in this instance at least. Of many thousands of larvae injected into the afferent lymph vessel of the popliteal gland less than 1 per cent. appeared in the efferent vessel, 99·2 per cent. were not accounted for; in another experiment nearly the same proportion, 98·4 per cent., were lost. Three possibilities as to their fate are arguable: 1. They were retained undamaged in the gland; 2. They were destroyed in the gland; 3. They had escaped. Section of the glands disproved the first and second of these.

KNOTT's argument that the embryos are less strong in day than in night blood and are kept back in the capillaries by day is not proven, but is moreover disproved by his own experiment of injecting embryos in large numbers into the blood vessels of a man at 10·40 p.m. and examining the blood at intervals over a period of 48 hours; no embryos were found. A second experiment on somewhat similar lines was corroborative of the same findings.

As regards the periodicity Lane's view is a daily parturition of the female worms at about the same hour and not that parturition is more or less continuous. The former hypothesis would account for the recurring wave of embryos in the blood stream, the latter would not. The question as to the site where the embryos are destroyed remains unanswered. [See also this *Bulletin*, 1935, Vol. 32, p. 274.]

H. H. S.

AFRICA (Candido M.), GARCIA (E. Y.) & LAYCO (Jaime). **Periodic Human Microfilaria in the Philippines.**—*Jl. Philippine Islands Med. Assoc.* 1935. Aug. Vol. 15. No. 8. pp. 407–412. [11 refs.]

There is in fact periodicity of human microfilariae in the Philippines.

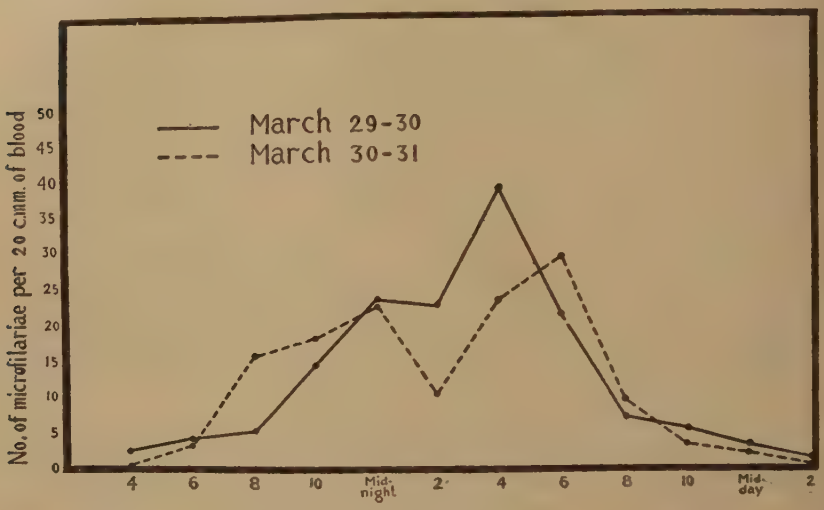
Counts were made of 2 cmm. of skin blood every 2 hours, at intervals from August to January, in a man who had never left the islands. Periodicity was marked. It is thought that both periodic and non-periodic forms of *W. bancrofti* are possibly present. It is suggested that in this case there may have been 4,585,000 microfilariae in the whole blood and as to periodicity and its explanation by daily parturition his comment is: "for the daily death of such an enormous number of larvae is bound to cause grave disturbances in the host analogous to the so-called protein shock, which does not seem to occur in filariated persons. Furthermore, the theory seems unbiological, since it would be a piece of great folly on the part of Nature to permit such wholesale death when, clearly, these microfilariae need to stay longer in the circulation in order to have more chance of getting into the mosquito host." [But in that case man's well being may have been in "Nature's" mind.]

C. L.

YEN (C. H.) & CHANG (T. L.). **The Periodicity of *Microfilaria malayi* Brug as observed from a Case in the Lester Chinese Hospital, Shanghai.**—Reprinted from *Lingnan Sci. Jl.* 1935. July. Vol. 14. No. 3. pp. 399–402. With 1 fig.

The periodicity in the two cases tested was marked.

In one of them 20 cmm. of blood was taken two-hourly for 48 hours. The graph shows the numbers of microfilariae.



Periodicity of *Microfilaria malayi* Brug from a Lester Chinese Hospital Case.

[Reproduced from the *Lingnan Science Journal.*]

C. L.

MONTEL (M. L. R.) & TRUONG-VAN-QUE. La carbone animal intraveineux dans le traitement des accès aigus fébriles de la lymphangite chronique éléphantiasigène des pays chauds. [**Injection of Animal Charcoal in Elephantoid Fever.**]—*Bull. Soc. Méd.-Chirurg. Indochine.* 1935. Apr. Vol. 13. No. 3. pp. 271–276.

Three cases are added to that already reported (MONTEL, this *Bulletin*, 1935, Vol. 32, p. 649). In all of them there was equally dramatic disappearance of lymphangitis and fever. They ceased within 24 hours, with immediate relief of the general symptoms and restoration to full health in 3 days. *C. L.*

HINMAN (E. Harold). **Studies on the Dog Heartworm, *Dirofilaria immitis*, with Special Reference to Filarial Periodicity.**—*Amer. Jl. Trop. Med.* 1935. May. Vol. 15. No. 3. pp. 371–383. With 1 chart. [16 refs.]

"A report is presented of data on *Dirofilaria immitis* infestation obtained by blood examination and subsequent autopsy of 93 dogs. It has been found that there is no correlation between the numbers of microfilariae in the peripheral blood stream and the numbers of adult female filarial worms present. A single female may account for several million embryos or may be responsible for only a few thousand at 5 p.m. The writer has

been unable to demonstrate the presence of a substance in the salivary glands of four species of mosquitoes which possesses a chemotactic effect upon the embryos of *Dirofilaria immitis*. A dog under observation, in screened animal quarters, continued to exhibit a constantly high number of microfilariae over a period of three years. *Aëdes aegypti* will develop the larvae of *Dirofilaria immitis* to an infective stage but in very carefully controlled experiments this species of mosquito was unable to transmit the infection to three dogs. The young larvae, after inoculation into a dog by mosquitoes, must undergo development in some location other than the heart since this organ contains only adult worms or nearly mature ones. It is believed that in the case of the dog heartworm cyclical parturition of the adult female filarial worms is not a major factor in the production of periodicity. This is substantiated by the long life which microfilariae may show following transfusion into an uninfected host and also by the enormous numbers of embryos per female worm which may appear in the dog's blood. Probably normal physiological processes in the dog account for the phenomenon of periodicity of microfilariae."

[Since in the body of the paper the reviewer's opinions are questioned it seems fair to say that his suggestion has been that the first step needed before drawing analogies between the periodicity of *D. immitis* and *W. bancrofti* is to have knowledge of the condition of the uterus of *D. immitis* at different hours comparable to that which O'Connor has given for *W. bancrofti*. If there is no such timing of parturition in *D. immitis*, but some secret place of hiding, a series of dogs can be put to death at given hours, and comparative and controlled counts made of the blood of different parts or organs. Indeed these can be punctured while the dog is alive with even greater ease. In the reviewer's opinion surmise should have a smaller place in explanation of periodicity in the dog's worm. The constancy of microfilarial counts from day to day seems to him to be no stronger evidence of the daily reappearance of the same microfilariae in the blood, than would be the idea that the constancy of daily counts of hookworm eggs in the faeces could be evidence that the eggs somehow got back into the intestine from day to day. Manson hardly originated the theory of diurnal parturition of microfilariae; he condemned Myer's suggestion (1881) of the "possibility of diurnal solution as the end of such embryos as do not come within mosquito range." The fact that in Hinman's paper the approximate number of microfilariae in the blood per female worm discovered varied in 15 dogs from 10,740 to 3,750,945 suggests that worms were living in places other than the heart, as it is stated they may.] *C. L.*

Hinman (E. Harold). **Experimental Studies on Filarial Periodicity.**—*Jl. Trop. Med. & Hyg.* 1935. Nov. 1. Vol. 38. No. 21. pp. 265–267. [17 refs.]

"In *Dirofilaria immitis* it is most improbable that cyclical parturition accounts for the phenomenon of filarial periodicity.

"No evidence of cyclical parturition could be found by examination of the uteri of large numbers of female worms at different periods of the day or night. The long life of microfilariae *in vivo* (as shown by transfusion) and *in vitro*, as well as the presence of enormous numbers of microfilariae per female worm, is submitted as evidence in opposition to this theory. The hypothesis of chemotactic effect of salivary secretion upon microfilariae has not been supported by experiments with *Dirofilaria immitis*.

The writer again reiterates his belief that periodicity in the dog heartworm is probably influenced by normal physiological processes in the animal. The elevation of the dog's body temperature as much as 4°F. and maintenance for two or more hours failed to have any effect upon the numbers of microfilariae in the peripheral circulation." *C. L.*

COUTELEN (F.). La longévité de la filaire *Loa loa* (Guyot 1778) et des embryons de filaires. A propos d'un cas de filariose diurne. [**Longevity of *Loa loa* and its Embryos.**]—*Bull. Soc. Path. Exot.* 1935. Feb. 13. Vol. 28. No. 2. pp. 126–134. [36 refs.]

A case of Loa infection followed up in France for 7 years.

A woman who had left the French Congo in September 1924 first showed Calabar swellings in hands, arms and eyelids in January 1931, but no microfilariae in the day blood on 8 occasions. In April 1931 a Loa crossed the conjunctiva and was taken out, 15 days later a second and on 27th November a third did the same and were at once taken out. Next day *Mf. loa* was first seen in the blood at 11·30 a.m. with an eosinophilia of 8 per cent., the note being made that this appearance did not take place till ten months after that of the oedema, and 7 years and 2 months after she had left the Congo. In a table are set out the length of life of the adult worm in the experience of 13 observers—between 4 and 15 years. *C. L.*

RODHAIN (J.) & VALCKE (G.). Quatre nouveaux cas de parasitisme par *Onchocerca volvulus* chez l'Européen. [**Four More Cases of Infestation of Europeans by *O. volvulus*.**]—*Ann. Soc. Belge de Méd. Trop.* 1935. Sept. 30. Vol. 15. No. 3. pp. 361–365. With 2 figs.

In all cases microfilariae were present in the fluid from punctured nodules, but in none were they seen in the skin though pruritus was marked in all. In 1 case an injection of 2 per cent. rivanol and 0·5 per cent. of novocaine was made into a nodule. When this was cut out 5 days later the worms were dead and shrunken with invasion by leucocytes. *C. L.*

D'HOOGHE (M.). Contribution à l'étude de l'onchocercose humaine dans l'Uélé. [**Onchocerciasis in Man in Uele (Belgian Congo).**]—*Ann. Soc. Belge de Méd. Trop.* 1935. June 30. Vol. 15. No. 2. pp. 159–199. With 12 figs. on 4 plates & 1 map. [5 pp. of refs.]

Blinding onchocerciasis is present in the Lower Uele.

Of adults 88 per cent. show nodules mostly on the trunk and about the pelvic girdle and only 5·7 per cent. on the head. Of 3,448 natives of the place 2·1 per cent. had eye trouble and about 0·5 per cent. were blind. Microfilariae were present in the bulbar conjunctiva in 59 per cent. of those with nodules on the head and in all of those who had eye symptoms. Owing to the presence of other infections dependence cannot be placed on dermal reactions. The skin symptoms leading up to scleroderma are held to be allergic, microfilariae playing quite a secondary rôle in causing them. When these are seen in cerebrospinal fluid the belief is that they have been carried there during the puncturing. Injection of 0·5 to 1 cc. of 5 per cent. thymol in carbon

tetrachloride causes destruction and absorption of nodules. Photographs show the skin conditions and one varicose lymph gland, though whether the last was a pure onchocerca infection is not stated.

C. L.

APPELMANS (M.). Les troubles visuels dans l'onchocercose africaine. [**Visual Disturbances in African Onchocerciasis.**]—*Rev. Belge Sci. Méd.* 1935. Aug.–Sept. Vol. 7. No. 7. pp. 525–539. [22 refs.]

An account, clinical and pathological, of the "blinding filaria" in Africa.

Three arguments were put forward by BRUMPT when making *O. caecutiens* a species different to *O. volvulus*—medical geography, the situation of nodules, the pathology. They do not seem to Appelmans to be of weight. As he has seen the disease in Africa it has 3 stages. The first is that of the forming of subcutaneous nodules, which are seen on the head in 5 per cent. of cases. In the second, lesions of the skin are seen and with them the presence of microfilariae in the skin. In the third are the eye lesions in 3 stages. The first is with photophobia, much congestion at the limbus and back to the equator of the eyeball, punctiform infiltrations about the limbus, but the centre of the cornea clear; microscopically are seen at the limbus much cellular exudation all round the vessels, the conjunctiva with full vessels, oedema, the outer third of the cornea with blood vessels and cellular exudation mostly in the superficial levels. In the second stage of the eye lesions there is inflammation of iris, ciliary body and choroid with some loss of sight caused by bodies, some of them microfilariae, in the vitreous, and the usual lesions of iritis and choroiditis. The third, happily not always come to, is blindness with atrophy of the eyeball, entrance of microfilariae into the sheath of the optic nerve and lesions inside it.

Microfilariae may have round them tissue which is quite healthy. Their ill-effects are perhaps due to their movements and to toxins. Most of them are seen at the limbus, in the ciliary body and conjunctiva, in the nerve sheath but not in the nerve or retina, there are few in the cornea or sclera. That is they are mostly present where connective tissue is loose and not made up of parallel bundles. *C. L.*

JOYEUX (Ch.), SÉDAN (J.) & ESMÉNARD (J.). Un cas d'onchocercose contractée à la Côte d'Ivoire, avec complications oculaires. [**Ocular Symptoms in a Patient with Onchocerciasis in the Ivory Coast.**]—*Bull. Soc. Path. Exot.* 1935. June 12. Vol. 28. No. 6. pp. 435–438.

The ocular trouble seems to have been limited to the conjunctiva, since vision was normal.

A forester of 35 had a skin eruption, a nodule under the skin over the left scapula and some lesions on the left conjunctiva. These last were made up of an elongated body 7 mm. long by 1 mm. broad, motionless, yellowish and pointed at one end, and of a dozen small rounded bodies like yellow grapes some of which were also present in the right conjunctiva. Three of these were cut out, two placed in saline without emigration of embryos, and the third sectioned. It proved to be a granuloma with many giant cells. The scapular nodule contained a

tangle of *O. volvulus* worms. There were no microfilariae in the blood and the eosinophilia lay between 47 and 35. A detailed note will be published in *Annales d'Oculistique.* *C. L.*

OSBORN (H. A.). **Onchocerciasis in England.**—*Lancet.* 1935. Nov. 2. p. 1000.

The title of the paper makes clear the author's view of the case.

A man of 62 who had never been out of Liverpool had for 5 years a scrotal swelling. Its quick increase in size in the last six months had made him uncomfortable. A hydrocele was present. Orchidectomy was undertaken. In cystic fibrous tissue was seen a larval nematode measuring 240 μ by 7 μ, without a sheath and with the tip of the tail free from the nuclear column. There was no eosinophilia and no microfilariae in the blood. The diagnosis was onchocerciasis, the man was a cotton porter at the docks and the suggestion is that he was bitten by an infected Simulium which came to the country in a cargo ship. [The reviewer by courtesy of Dr. Osborn has seen the slide. The solitary larva is complete though coiled, lies in a recess in the tissue, has a long tail sharply pointed and the nuclear column is not reminiscent of that of *Mf. volvulus.* There were apparently no nodules under the skin and no examination of lymph from the dermis was made for embryos. The reviewer has seen hundreds of sections made by O'CONNOR and has not once seen a whole microfilaria in them. He regrets that on the grounds put forward the claim is made for this as a clear case of onchocerciasis got in England.] *C. L.*

LINDBERG (K.). Un ver de Médine siégeant au voile du palais.—*Bull. Soc. Path. Exot.* 1935. June 12. Vol. 28. No. 6. pp. 438–441.

CASTENS (E.). Ueber Gnathostoma beim Menschen in Siam. [**Gnathostoma Infection of Man in Siam.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1935. Aug. Vol. 39. No. 8. pp. 337–342.

The author's experience is based on about 40 cases of this infection.

The outstanding points in it are, eosinophilia without helminths in the intestine, and frequently with circumscribed transitory swellings. The percentage of eosinophilia has been between 19 and 82, and it is generally, but not always, highest early in the infection, of neutrophils 11 to 62 and these commonly have a shift to the left, of lymphocytes 7 to 33. The swellings may be as big as the palm of the hand, are generally right under the skin with redness and pain, but may be deeper, lasting from 2 to 3 days to 1 to 4 weeks and then come to view again not far from where they were first seen. Lung and brain symptoms have been seen in these infections. *C. L.*

WAITE (C. H.) & GORRIE (Rachael). **A Gongylonema Infestation in Man.**—*Jl. Amer. Med. Assoc.* 1935. July 6. Vol. 105. No. 1. pp. 23–24. With 1 fig.

A male gongylonema was taken by a white man of 30 from the "roof of his mouth" which had been sore for 3 months.

The authors' belief is that it is the first male gongylonema got from man. Six weeks later the nervous symptoms which the man had had

were gone and the palate had healed. Some measurements of the worm are given. The microphotographs make it clear that the worm is a gongylonema, but little more. *C. L.*

FAUST (Ernest Carroll) & MARTINEZ (William H.). **Notes on Helminths from Panama. II. Rare Human Nematode Eggs in the Feces of Individuals from the Chagres River, Panama.**—*Jl. Parasitology.* 1935. Oct. Vol. 21. No. 5. pp. 332–336. With 3 figs. [10 refs.]

Eggs of *Capillaria hepatica* and of *Gongylonema* were seen in faeces and were probably contaminations. *C. L.*

FRASER (W. A. Carr). The Comparison of the Efficiency of Anthelmintics. —*Parasitology.* 1935. Oct. Vol. 27. No. 4. pp. 465–475.

TROPICAL DERMATOLOGY.

A REVIEW OF RECENT ARTICLES, II.*

Blastomycosis.—Since 1931 CARRIÓN[1] has seen six cases of Chromoblastomycosis in Puerto Rico. In one of these, a male white agricultural labourer, the clinical picture differed from that usually seen. The disease first started on the left wrist some twenty years ago and had since then slowly involved most of the hand, forearm and elbow. The lesions were patchy and psoriasiform, intermingled with extensive zones of scarring. No nodules or vegetative masses were present. The histological changes were typical but the fungus isolated by culture appeared to constitute a new species and will be the subject of a later communication. In the meantime it is proposed to call it *Hormodendrum compactum.* The first case of Chromoblastomycosis to be recognized in Uruguay is described by MACKINNON.[2] He also reviews the disease generally and in particular from the point of view of world distribution. ROSENTHAL[3] has published some details of a remarkable case of blastomycosis seen in Philadelphia, where the infection is rare. The patient was an infant aged six months in whom the lesions had appeared three weeks before coming under observation. Apparent cure resulted from six months' treatment with potassium iodide and X-rays. The greater part of the paper is devoted to details of histology and morphology, the organism being the *Cryptococcus gilchristi.* TOTZE[4] has written a long paper concerning the pathology of a specimen, a small skin tumour, obtained from Liberia. No clinical notes are appended but the microscopical features of the nodule and of the mycotic elements are given in very great detail. The fungus presents appearances which would seem to relate it to both the yeasts and the coccidioides. The paper also describes a new method of fixing such preparations which allows the subsequent use of a great variety of stains.

Mycetoma.—During the past twelve months two cases of "Madura foot" have been detected in Eastern Europe. ILDRIM[5] reports the first case from the U.S.S.R., a native girl from the Northern Caucasus. No clinical details are given but the fungus, which proved to be of the black type, is described very fully. A well-illustrated article by

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* For the first of this series see Vol. 32, p. 181.

[1] CARRIÓN (A. L.). Chromoblastomycosis. Preliminary Report on a New Clinical Type of the Disease caused by *Hormodendrum compactum,* Nov. Sp.—*Puerto Rico Jl. Public Health & Trop. Med.* 1935. June. Vol. 10. No. 4. pp. 543–545. With 2 figs. on 1 plate. [Spanish version pp. 546–548.]

[2] MACKINNON (J. E.). Estudo del primer caso uruguayo de cromoblastomicosis y 'revista critica' sobre la enfermedad. [A Study of the First Uruguayan Case of Chromoblastomycosis and a 'Critical Review' of the Disease.]—*Arch. Urug. Med.* 1934. Vol. 2. pp. 201–226. With 8 figs. [Summarized in *Rev. Applied Mycology.* 1935. Aug. Vol. 14. Pt. 8. p. 509.]

[3] ROSENTHAL (J. M.). Blastomycosis in an Infant Six Months Old.—*Jl. Lab. & Clin. Med.* 1935. Aug. Vol. 20. No. 11. pp. 1164–1165.

[4] TOTZE (Richard). Beitrag zur Pathologie τ exotischen Blastomycosen.—*Ztschr. f. Parasitenk.* 1935. Sept. 11. Vol. 7. No. 6. pp. 679–701. With 16 figs. [1 page of refs.]

[5] ILDRIM (D. J.). Madurapilz im Nordkaukasus (U.S.S.R.).—*Arch. f. Schiffs- u. Trop.-Hyg.* 1935. Aug. Vol. 39. No. 8. pp. 348–349.

BORDJOŠKI and MILOCHEVITCH[6] deals with a case seen in Northern Jugo-Slavia. The patient was a woman, 42 years of age, who injured her left foot some 28 years before. There was no obvious lesion at the time but the foot thereafter showed occasional swelling until the dorsum became discoloured and exfoliating two or three years after the accident. The area now bled easily on slight trauma and enlargement of the whole foot became apparent. A small tumour was noticed over the fourth toe when the patient was aged about 20 and some surgical operation was then performed. It is noteworthy that until now the patient had never left her native village. Subsequently small, livid, red nodules appeared on the dorsum and some of these broke down to discharge a yellowish white fluid; a few of the consequent sinuses healed. About six years ago small, colourless grains were noticed in the discharge, whilst pain and swelling increased. When the woman was seen by the authors she was cachectic and the left leg was somewhat atrophied. The foot itself was enlarged and all its joints, including the ankle, were fixed. The sole was normal in colour but the dorsum was patchily dark grey and red with scattered white scars. There were very many maize-sized nodules. Sinuses discharged a colourless or blood-stained fluid containing pale yellow granules of varying sizes. The left inguinal glands were swollen, adherent and painful, whilst radiography demonstrated irregularity and thickening of bone together with destruction and osteoporosis. Injections of an iodide caused local and general reaction of such severity that amputation was ultimately performed at the patient's own request. Minute morphological and cultural details of the fungus are described, but experimental inoculation into rabbits proved unsuccessful. It would seem that the organism is new, so that the authors propose to call it *Actinomyces brumpti* n. sp.

Acladiosis and Paracladiosis.—One of the many excellent articles in the special dermatological number of the *Journal of Tropical Medicine and Hygiene* has been written by CASTELLANI and JACONO[7] on this subject. The disease has been seen in Malay, South America, Siam and Ceylon. In a typical example ulcerations may occur anywhere on the body but are less common on the head, palms and soles. Each ulcer is sharply defined, round or oval and its size may be from that of a sixpence to that of a half-crown; it secretes an abundant purulent fluid which dries to form thick, yellow, rupioid crusts. Removal of these crusts shows the bases of the ulcers to be studded with rather prominent red granulations. Occasionally gumma-like swellings may also be present. The disease is chronic, may be accompanied by slight fever and later gives rise to a secondary anaemia. Treatment consists of large doses of potassium iodide by mouth and mild antiseptic lotions locally. The causative fungus is the *Acladium castellanii*. Recently a Chinaman was seen whose disease matched the above description except for the fact that the ulcerations were neither so definite nor so deep. Potassium iodide did not have much effect and Castellani's fuchsin paint proved the most efficient local dressing.

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[6] BORDJOŠKI (M.) & MILOCHEVITCH (S.). Sur un cas de pied de Madura en Yougoslavie produit par une espèce nouvelle d'*Actinomyces*, *Actinomyces brumpti* n. sp.—*Ann. Parasit. Humaine et Comparée.* 1935. Jan. 1. Vol. 13. No. 1. pp. 36–51. With 10 figs. on 2 plates. [11 refs.]

[7] CASTELLANI (Aldo) & JACONO (Igino). Acladiosis and Paracladiosis.—*Jl. Trop. Med. & Hyg.* 1934. Dec. 1. Vol. 37. No. 23. pp. 360–363. With 2 plates (1 coloured).

A different fungus was found in this case, *Ascothrica chartarum* Berkeley 1838, var. *orientalis* Castellani and Jacono 1934. The patient declared that the infection is not rare in Central China (Shenshi).

Piedra.—WOLFF and GERLACH[8] describe a case seen in Batak, Dutch East Indies, a man whose scalp was heavily infected by a fungus which culture proved to be a *Trichosporon*. The disease was rapidly cured by means of several thorough washings with warm soapy water. No other cases were known or could be discovered in the neighbourhood.

Pinta.—There has now been published by FOX[9] a review of the work carried out in Mexico between the years 1929 and 1931 by the commission appointed under the leadership of URUEÑA. The disease is endemic in the southern half of the Republic, where nearly 11 per cent. of the total population of 2,500,000 were found to be affected. Cases of the blue type were 67,380 in number, of the white type 57,277, of mixed types 51,731, of lead-coloured type 27,281, together with smaller numbers of violet, black, red and yellow varieties. The mucous membranes were affected in 72,873 of these 270,685 patients, but scaling was present only in 90,000. Constitutional symptoms were very variable and the value of their consideration is regarded as doubtful. The disease is most common between the ages of 30 and 40. No conclusions could be drawn as to the influence of occupation, avitaminosis or the proximity of rivers. The idea of contagion predominated, insect bites being frequently suggested. It is said that the same infection is found in dogs, horses and pigs in some areas. FERNANDO[10] describes the lesions seen in a Malay boy, 11 years of age, who had never been out of Ceylon. A small, black patch appeared on the right cheek some four years before. This gradually enlarged and became darker until about six months had elapsed when the centre became reddish. Later the patch turned white and new, roundish areas with sharp outlines developed below the eyelids and behind the ears. Itching was intense. Prolonged treatment with 3 per cent. resorcin and 2 per cent. salicylic acid in soft paraffin cleared the lesions but did not affect the achromia. The *Aspergillus* cultures are also described.

Tinea imbricata.—The history of this disease is dealt with by CASTELLANI[11], who starts from Dampier's description in "A Voyage Round the World," published in 1789. The four species of fungi are discussed and the author claims that at least two species must be admitted, *Endodermophyton tropicale* and *E. indicum*. There are four principal clinical types, concentric, diffuse, moulting and mixed. He also describes a very chronic example seen in an Englishman who first contracted the disease in 1916 in Arabia. The fuchsin paint has now almost cured him, all previous applications having failed.

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[8] WOLFF (J. W.) & GERLACH (J. H. A.). Een geval van Piedra.—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1935. Mar. 19. Vol. 75. No. 6. pp. 515–518. English summary (7 lines).

[9] FOX (Howard). A Census of Mal del Pinto in Mexico.—*Arch. Dermat. & Syph.* 1935. Feb. Vol. 31. No. 2. pp. 227–229.

[10] FERNANDO (S. E.). Pinta. Notes on a Case occurring in Ceylon.—*Jl. Trop. Med. & Hyg.* 1934. Dec. 1. Vol. 37. No. 23. pp. 375–376. With 2 text figs.

[11] CASTELLANI (Aldo). Tinea Imbricata (Tokelau). A Short General Account with Report of a Case in a European.—*Jl. Trop. Med. & Hyg.* 1934. Dec. 1. Vol. 37. No. 23. pp. 363–368. With 1 fig. & 4 plates (2 coloured). [31 refs.]

Favus.—CATANEI[12] reports his observations of 23 native children seen in the plain of Mitidja, Algeria. Their ages varied from 2 to 13 years and they were all re-examined at odd times from 2 to 7 years after the diagnosis of favus of the scalp had first been made. No treatment of any kind was ever given. Two cases were found to have healed spontaneously within twelve months, two within two years, one within three years and one within four years. Three other children were seen in whom the disease had almost disappeared. Therefore the infection does often die out spontaneously without leaving any appreciable scarring.

Tinea tonsurans.—A scarring ringworm of the scalp, *Tinea decalvans perstans*, is seen from Ceylon to China. CASTELLANI[13] describes these cases, which are due to *Trichophyton violaceum* Bodin var. *decalvans* Castellani. The scalp shows one or more patches covered with a very large number of heaped-up, white, branny scales. After a time both scales and hair disappear to leave smooth bald patches. These areas remain permanently bald although the actual amount of scarring is not heavy. Microsporon infections of the scalp are very rare in the Mediterranean basin and CATANEI[14] states that only three have been hitherto noted in Algeria since 1906. Recently he has found eight more cases in Algiers, two of whom were Europeans, one a Jew and the rest natives. In every case the offending organism proved to be *M. felineum.* The same author[15] has been trying to determine the resistance to reinfection by ringworm. The animals used were guinea-pigs and the fungus was *Trichophyton asteroides.* He found that when the animal shows local inflammatory reaction to the infection an immunity is produced and this is proved by the difficulty experienced in producing reinfection over fourteen months. Those animals which have been infected and which later react strongly to trichophytine, are also immune for long periods. The acquisition of immunity is slow and is never attained before the fungus has actually attacked the hairs. Attempts to produce immunity by injections of trichophytine gave very poor results. Inoculation of the fungus by means other than the skin (*e.g.* intraperitoneal) also gave rise to very little resistance. It would also seem to be true that some dermatophytes never produce immunity.

Epidermophytosis.—When any subject is dealt with by the observer who originally described or discovered the cause of the disease in question, the article must prove of great interest. WHITFIELD[16] has contributed such a paper on epidermophytosis, but his remarks are restricted to treatment. It is important to note that he believes cure may be effected in most cases, in the absence of affection of the nails. Two other great difficulties present themselves; the fungus may be

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[12] CATANEI (A.). Sur la guérison naturelle précoce du favus.—*Bull. Soc. Path. Exot.* 1935. May 8. Vol. 28. No. 5. pp. 344–345.

[13] CASTELLANI (Aldo). Tinea Decalvans Perstans.—*Jl. Trop. Med. & Hyg.* 1934. Dec. 1. Vol. 37. No. 23. pp. 368–369. With 5 figs. on 1 plate.

[14] CATANEI (A.). Huit nouvelles observations algériennes de microsporie.—*Arch. Inst. Pasteur d'Algérie.* 1935. June. Vol. 13. No. 2. pp. 216–218.

[15] CATANEI (A.). La résistance aux réinfections dans les teignes (étude expérimentale).—*Arch. Inst. Pasteur d'Algérie.* 1935. June. Vol. 13. No. 2. pp. 219–232. With 1 fig. & 1 plate.

[16] WHITFIELD (Arthur). Some Notes on the Treatment of Epidermophyton Infection.—*Jl. Trop. Med. & Hyg.* 1934. Dec. 1. Vol. 37. No. 23. pp. 353–355.

so deeply embedded in thick horny tissues that the fungicide cannot get at it and there seems to be a stage where very resistant spores are formed. This resting stage may be suspected clinically in patients with exfoliation but no vesiculation. In specimens taken from such a case there may be seen thick-walled, round or oval elements between segments of mycelium or at the end of a strand. In order to avoid infection when in contact with known cases it is important never to walk barefooted and never to borrow socks or slippers, for the disease is spread by bath-mats, Turkish baths, etc. An infected patient should take appropriate precautions to avoid spreading the fungus and should wear special slippers in the bath-room. These have loofah soles and bath-towel uppers ; they can be sterilized by boiling. The ordinary socks may be protected by wearing thin cotton socks or toe-guards under them. The feet should be dried with " cotton roll " which can be destroyed subsequently. Locally many applications are of value in different cases but on the whole he recommends the following ointment and lotion :—

Acid. benzoic.	...	gr. 25	Acid. benzoic.	...	dr. 1½
Acid. salicyl.	...	gr. 15	Acid. salicyl.	...	dr. 1
Paraff. moll.	...	dr. 2	Acetone ...	...	oz. 1
Paraff. dur.	...	gr. 15	S.V.M.I. ad	...	oz. 4
Ol. coc. nucis ad		oz. 1			

In chronic cases where there is not much ulceration the following prescriptions are often useful :—

Cupri nitrat.	...	gr. 40	Liq. ferri perchlor.		dr. 1
Acid. benzoic.	...	dr. 1½	Alumin. chlorid.	...	dr. 2
Acetone ...	...	oz. 1½	Acid. hydrochlor.		
S.V.M.I. ...	...	oz. 5½	dil. ...	...	dr. 1
Aq. ad	...	oz. 8	Aq. destill. ad	...	oz. 4

Treatment of this affection is also dealt with by GARCIA[17] who experimented on the students in the College of Medicine in Manila. He treated 20 cases with formalin and claims 100 per cent. cure where the solution was over 25 per cent. in strength. With a 50 per cent. solution the average number of applications which attained this desirable result was but four. Wright's stain (methyl blue in methyl alcohol) was used in 15 cases. Cure resulted after six applications of the undiluted stain. The author gives no statement as to the period over which the patients were observed after their apparent recovery. He also makes the following astounding statement, "among the physical therapeutic agents X-ray is still the best." [It is true that radiotherapy allays eczematization but it does not kill the fungus. It is surprising how much misapprehension still exists on this score.] PEIRIER and RAYMOND[18] have written in praise of Vlemingckx's solution and ointment, each of which contains a mixture of the polysulphides of calcium. Full details are given as to the methods of manufacture of these preparations. In Indo-China these applications have proved their value in all parasitic diseases, including those due to fungi. GRÜTZ[19] has written of his experiences in Bonn.

[17] GARCIA (Eusebio Y.). Treatment of Tricophytosis of the Feet by Formalin and Wright Stain.—*Jl. Philippine Islands Med. Assoc.* 1935. May. Vol. 15. No. 5. pp. 273–276.

[18] PEIRIER & RAYMOND. Solution de sulfure de calcium (Wleminck) contre les dermatoses parasitaires. Note thérapeutique.—*Bull. Soc.-Méd.-Chirurg. Indochine.* 1934. Aug.–Sept. Vol. 12. No. 7. pp. 727–728.

[19] GRÜTZ (O.). Ueber die Epidermophytie.—*Med. Klin.* 1935. Sept. 13. Vol. 31. No. 37 (1604). pp. 1189–1192. With 3 figs. [21 refs.]

He does not believe that transmission in swimming-baths is really serious. Certainly his bacteriological investigations in such places have not been very successful in the detection of these fungi. Some 693 cases seen in Buda-Pest during the last 15 years have been analysed by BALLAGI[20]. All were under clinical suspicion and in only 167 was he unable to prove the presence of fungus. There were 41 classical examples, sharply defined and having pustules. Interdigital erosions only were seen in 255 and onychomycosis occurred in 87. There were 44 cases of yeast infections, all of which gave positive reactions to levurine. CARRIÓN[21] reports two cases of infection of the toes in Puerto Rico. Both were due to *E. floccosum*, which had never been previously detected. The fungi which had always been found before were *T. rubrum* and *T. gypseum*. A well-illustrated article which gives full mycological details.

The Culture of Fungi.—A method of recovering typical cultures from old growths which have become downy and pleomorphic has been very fully described by ACTON & DEY.[22] This pleomorphism in old laboratory cultures has always been a difficulty in the study of mycology. Therefore the authors first confirmed the results of other workers who used such natural media as leather, bones, etc. Their experiences decided them to reduce the favourability of the conditions under which the cultures were made. For the preliminary subcultures feathers are mounted on plaster of Paris blocks and put into test-tubes containing a little water. Cotton-wool plugs are used. The whole is then sterilized in an autoclave at 120°C. Material from pleomorphic cultures is then inoculated on the rachides of the feathers. These subcultures grow well whilst water is still present and at first are of the *duvet* type. Gradually, however, the growths dry and skrink, becoming more and more adherent after the water has dried up. After being kept in the dry tubes for one month specimens are inoculated into different standard media. It is found that the fungi now grow true to type, having lost all pleomorphic features. It is suggested that in dry feather culture spores become dominant. Their germination results in true cultures whereas reproduction from mycelium gives rise to pleomorphism. Similar effects have been found with old cultures in Sabouraud's medium, cultures which had become dry with age.

Other Fungus Infections.—HANSMANN & SCHENKEN[23] report a very curious case in a white, middle-aged man. The eruption first appeared behind the knees in 1917 and gradually spread. In 1931 there was a dry, scattered, papular, itching rash which had one year later spread over the entire body as a mixture of papules, scales and ulcers of 3 to 4

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[20] BALLAGI (Stephan). Ueber Hand- und Fussmykosen mit besonderer Berücksichtigung der mykotischen Dyshidrose.—*Med. Klin.* 1935. Sept. 13. Vol. 31. No. 37 (1604). pp. 1204–1205.

[21] CARRIÓN (A. L.). Observations on Dermatomycosis in Puerto Rico. Further Report on the Etiology of Epidermophytosis.—*Puerto Rico Jl. Public Health & Trop. Med.* 1935. Mar. Vol. 10. No. 3. pp. 255–261. With 7 plates. [Spanish version pp. 263–269.]

[22] ACTON (H. W.) & DEY (N. C.). A Simple Method of recovering Typical Cultures of Dermatophytes from Pleomorphic Growths.—*Indian Med. Gaz.* 1934. Nov. Vol. 69. No. 11. pp. 601–604. With 3 text figs. & 12 figs. (5 coloured) on 2 plates.

[23] HANSMANN (G. H.) & SCHENKEN (J. R.). A Unique Infection in Man caused by a New Yeast-like Organism, a Pathogenic Member of the Genus Sepedonium.—*Amer. Jl. Path.* 1934. Nov. Vol. 10. No. 6. pp. 731–738. With 9 figs. on 4 plates.

cm. diameter. The most recent ulcers were irregular and showed a tendency to confluence; the mucous membrane of the mouth was thickened. The man was very emaciated but all general and pathological examinations were negative except for the results of biopsy. The skin showed a chronic inflammatory process with yeast-like organisms both free in the tissues and phagocyted. Despite all treatment death ensued rapidly. Post-mortem there were fibrotic, fatty or necrotic changes in many organs. The same organisms were found in the lungs, adrenals and lymph glands. Cultures were similar to those of *Oidium gilchristi*, but differed therefrom in that the spores were large and spiculated whilst the mycelium was delicate. The organism also proved pathogenic to dogs, rabbits, guineapigs and rats. At the moment it is proposed to classify it with the genus *Sepedonium*. SARTORY, SARTORY, MEYER & WEISS[24] have published a paper which deals in detail with a yeast, obtained from scales which have been procured from natives suffering from skin disease in French Equatorial Africa. They propose to name the organism *Blastodendrion schweitzeri* n. sp. Unfortunately no clinical descriptions are included in this paper.

Verruga.—As it is now proved that verruga and Oroya fever are but different types of the same infection, FOX[25] proposes that the entire process be known as Carrion's disease in honour of the student who lost his life after a voluntary inoculation. The malignant type (Oroya fever) is restricted to certain parts of Peru and gives rise to a profound anaemia more rapidly than does any known condition other than haemorrhage. The benign type differs from all known dermatoses. The skin shows miliary papules arising on tiny petechial spots; these papules gradually increase in size and eventually the older lesions become pedunculated. The eruption may occur anywhere on the body but it tends to attack the extensor surfaces of the limbs more severely and to leave the palms and soles free. Sometimes a few hard subcutaneous nodules are seen and the mucous membranes may be affected. The causative organism is *Bartonella bacilliformis*. Infection with one type of the disease produces immunity to the other type. The insect vector (a species of phlebotomus) has been discovered and the existence of a plant reservoir is possible. No specific treatment is known.

Epidemic Dropsy.—Cutaneous manifestations were very prevalent in the 1934 outbreak in Bengal and its adjacent States. CHOPRA & CHAUDHURI[26] report 15 such examples out of 39 cases. Of these, 9 showed an intense erythema almost purple in colour, over the extremities and abdomen. "Sarcoids" were seen in 4 patients. These were sessile, pedunculated, ulcerated or fungating when fully developed, but they start as minute red papules which gradually enlarge and become vascular. The largest seen measured 1½ inches in diameter. One case showed erythema and "sarcoids," whilst another suffered from erythema together with pigmentation of the face, hands and feet.

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[24] SARTORY (A.), SARTORY (R.), MEYER (J.) & WEISS (R.). Etude d'un champignon levuriforme nouveau isolé d'une dermatomycose tropicale.—*Bull. Acad. Méd.* 1935. Apr. 16. 99th Year. 3rd Ser. Vol. 113. No. 15. pp. 486–488.

[25] FOX (Howard). Verruga Peruana (Carrion's Disease) based on Personal Experience in Peru.—*Jl. Amer. Med. Assoc.* 1935. Mar. 23. Vol. 104. No. 12. pp. 985–990. With 6 figs. [31 refs.]

[26] CHOPRA (R. N.) & CHAUDHURI (R. N.). Cutaneous Manifestations of Epidemic Dropsy. Part I. A Clinical Study.—*Indian Med. Gaz.* 1935. Sept. Vol. 70. No. 9. pp. 493–496. With 4 coloured plates.

The same authors, together with PANJA,[27] have also studied the histology of the above signs. The chief changes occur in the blood vessels; these are dilated and surrounded by proliferated endothelial cells. Sometimes there is formation of new capillaries which give rise to the "sarcoids." Experimental cultures and inoculations into volunteers and monkeys all gave negative results. [It is a pity that the term "sarcoids" has been used to describe the lesions which are essentially haemangiomatous in structure.]

Animal Parasites.—BOYÉ and RIVIEREZ[28] report a curious rash from French Guiana. It consisted of a "run" 1½ cm. in length on the left cheek, the older part of which showed serous scabs whilst the advancing point surmounted fine vesicles. An acarus was extracted and proved to be a male *Tarsonemus*, but the source of the infection remained obscure despite all investigations. The greater part of the article describes the microscopical appearances of the mite in great detail. A very severe case of Norwegian scabies is described by FIALHO,[29] the subject being the emaciated corpse of an old woman who had died of tuberculosis in a hospital in France. The clinical appearances were severe but typical. Excellent microphotographs help to support the author's contention that this acarus is indistinguishable from the *Acarus scabiei*. That mites affect poultry and many wild birds is well-known but it has been left to LAWRENCE[30] to describe a series of cases of human infection. These occurred in Australia and the skin changes were characteristic of parasitic infections. These mites (*Dermanyssus avium et gallinae*) also live on sparrows, starlings and pigeons, whose abandoned nests they may leave to invade a house. The same paper also deals with trichomes (*i.e.*, minute hairs, scales, etc., from plants) and in particular with those shed from the plane trees of Melbourne. These spicules become caught in the material of underwear, shirt collars, etc., when they can cause itching eruptions, which look, however, as though they were due to external irritation. CAWSTON[31] deals with "Creeping eruption" as seen on the Natal coast where sand larvae are common within ten feet of the edge of water in the mangrove marshes. They concentrate on wet banks, in depressions and ditches, whilst their development is favoured by humidity and decaying leaves. The *Ancylostoma braziliense* is the known cause and is a common hookworm of domestic pets in Natal. The movements of the larvae cause little discomfort but severe irritation is felt at the end of the "tunnel" where there is an intense inflammatory reaction after the larva has passed farther on. Good results are obtained by freezing with carbon

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[27] CHOPRA (R. N.), CHAUDHURI (R. N.) & PANJA (D.). Cutaneous Manifestations of Epidemic Dropsy. Part II. A Histopathological Study.—*Indian Med. Gaz.* 1935. Sept. Vol. 70. No. 9. pp. 496–498. With 11 figs. on 2 plates.

[28] BOYÉ (R.) & RIVIEREZ (M.). Un cas de dermatose accidentelle du type sarcoptique, provoquée par un *Tarsonémus*.—*Bull. Soc. Path. Exot.* 1934. Oct. 10. Vol. 27. No. 8. pp. 759–762. With 1 fig.

[29] FIALHO (Amadeu). Sur un cas de gale norvégienne.—*Ann. Parasit. Humaine et Comparée.* 1934. Nov. 1. Vol. 12. No. 6. pp. 472–481. With 1 text fig. & 10 figs. on 5 plates.

[30] LAWRENCE (Herman). The Pathogenicity of *Dermanyssus avium et gallinae* and of Trichomes in the Human Being.—*Med. Jl. Australia.* 1935. July 6. 22nd Year. Vol. 2. No. 1. pp. 16–20. With 6 figs.

[31] CAWSTON (F. G.). Creeping Eruption at the Natal Coast.—*Jl. Trop. Med. & Hyg.* 1934. Dec. 1. Vol. 37. No. 23. pp. 374–375.

dioxide snow or by soaking lint in ethyl acetate and afterwards covering this dressing with an impervious material.

Dermatitis venenata.—In the Northern Argentine a disease has been known for a long time under the local name of " el páaj." DI LULLO[32] has now dispersed the legends attaching to the eruption and proved it to be due to contact with a tree known as the " coloured quebracho," a member of the *Anacardiaceae* whose scientific name is *Schinopsis lorentzii*. The typical eruption consists of reddish macules surrounded by hardish papules and a few vesicles which sometimes become purulent. There is some diffuse, painful oedema accompanied by slight temperature, malaise, anorexia and headaches. There is also painful enlargement of the glands draining the affected area; they never suppurate, however. The rash has been reproduced experimentally by rubbing the skin with leaves, flower, fruit, alcoholic extract of leaves and by using the distillate obtained after boiling them with water.

Xeroderma pigmentosum.—Two examples in the same family are described by BELISARIO.[33] The skin changes were characteristic in the brother and sister, aged 8 and 14 years respectively. In both the disease started in infancy and in both there appeared partial loss of function of the left hand early in childhood. The wrist is flexed to a right angle and there is loss of use and control of the fingers, but no sensory changes are apparent. Pathological investigations were negative.

Keratoma plantare sulcatum.—A description of this disease as seen in Dutch Guiana is given by AARS.[34] During the rainy season the thickened horny layer of the soles develops numerous holes of different sizes and depths. Furrows may appear later but all these lesions never spread deeper than the horny layer. Accumulated dirt then makes these depressions stand out against the yellowish skin with marked clarity. The changes start early in life and are probably non-follicular forms of primary hyperkeratosis. No evidence has been found to support the contention that it may be due to yaws, syphilis or any mycotic infection.

Prickly heat.—BOULNOIS[35] writes about the four skin diseases which are particularly prevalent in the humid climate of Bengal. Epidermophytosis, Coolie itch (see ACTON and MCGUIRE, this *Bulletin*, 1929, Vol. 26, p. 682), furunculosis and prickly heat are dealt with. In the last condition the author is successful with the following treatment. After a thorough bathing and scrubbing there is applied a lotion which consists of 1 to 40 per cent. formalin and 0·5 per cent. menthol in 70 per cent. alcohol or eau de Cologne. The lotion may be dabbed on three or four times a day.

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[32] DI LULLO (Orestes). " El páaj." Une nouvelle dermatite vénéneuse.—*Rev. Sud-Américaine de Méd. et de Chirurg.* Paris. 1934. Sept. Vol. 5. No. 9. pp. 513–523.

[33] BELISARIO (John C.). Two Cases of Xeroderma Pigmentosum occurring in the Same Family.—*Med. Jl. Australia.* 1935. Aug. 3. 22nd Year. Vol. 2. No. 5. pp. 148–150. With 6 figs.

[34] AARS (Charles G.). Keratoma Plantare Sulcatum (Castellani).—*Jl. Trop. Med. & Hyg.* 1934. Dec. 1. Vol. 37. No. 23. pp. 372–373. With 1 fig.

[35] BOULNOIS (J.). A propos de quatre affections de la peau communes à l'Européen et à l'indigène dans les pays tropicaux à chaleur humide et en particulier le Bengale.—*Rev. Méd. et Hyg. Trop.* 1935. July–Aug. Vol. 27. No. 4. pp. 202–213. With 1 fig.

Influence of Climate.—The effects of climate on surgical skin conditions in Egypt are dealt with by KNIPFER.[36] In particular he considers the electrical and hygrometric conditions and finds that boils, whitlows, abscesses and adenitis show a greater incidence during August and September, the months when the *absolute* humidity is at its greatest. LAWRENCE[37] has studied the same subject in Australia, but has paid special attention to keratoses, rodent ulcers and epitheliomata. These are all far more common in Australia than they are in the British Isles or the United States. The sun's rays and low humidity both play a part. Pigment undoubtedly protects the skin as these growths are never seen in the aborigines. *M. Sydney Thomson.*

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[36] KNIPFER (A.). Relation of Electrical and Hygrometric Conditions of the Atmosphere to Surgical Skin Infections in Egypt.—*Jl. Trop. Med. & Hyg.* 1935. May 15. Vol. 38. No. 10. pp. 123–129. With 1 chart. [75 refs.]

[37] LAWRENCE (Herman). The Incidence of Skin Conditions in Australia.—*Brit. Med. Jl.* 1935. Sept. 28. pp. 572–575. With 2 figs. (maps).

MISCELLANEOUS.

SALAH (M.). **Studies on Anaemia in Egypt. I.—Methods of Investigation. II.—Helminthic Anaemias. III.—Treatment and Mechanism of Helminthic Anaemia. IV.—Rarity of Addisonian Anaemia in Egyptians.**—*Jl. Egyptian Med. Assoc.* 1935. July. Vol. 18. No. 7. pp. 425–437. With 1 fig.; 438–454; 455–472. [24 refs.]; 473–482. With 1 fig. [19 refs.]

These lectures by Dr. Salah form an important contribution to the study of tropical anaemias and in consequence those who are interested in the subject would be well advised to read for themselves this special number of the Journal of the Egyptian Medical Association.

I. *Methods of Investigation.*

In his introductory remarks Dr. Salah points out that considering the low diet of the poorer classes and the gastro-intestinal pathology resulting from alimentary parasites, it is only natural that anaemia should prove a prevalent ailment in Egypt. Such anaemias may arise from three factors—blood destruction, blood loss and deficient blood formation—and for their complete elucidation investigations should include a clinical examination, a haematological investigation and a search for parasites and their ova, as well as special gastro-intestinal tests.

The clinical examination.—Apart from the history and the examination of the different systems there should be a routine inspection of the skin, sclera, mouth, nails and thyroid gland. Spoon nails, for example, are diagnostic of hypochromic anaemia, while clubbing suggests tuberculosis, chronic sepsis, etc. Glossitis is associated with both Addisonian anaemia and idiopathic hypochromic anaemia and the Plummer-Vinson syndrome: bleeding gums may result from aplastic anaemia, haemorrhagic diathesis or scurvy, while stomatitis and pharyngitis terminating in necrosis of tissue may be the only manifestation of aplastic anaemia or agranulocytosis. A pigmented line in the gums is always suggestive of lead or bismuth poisoning.

Haematological examination.—The author states that an examination of a blood film stained with Jenner's stain and a haemoglobin estimation by Sahli's method should be included as a routine measure in the examination of all patients in Egypt. If more detailed haematological studies be required, as suggested by the clinical findings, 1 cc. of blood is drawn from a vein without the application of a tourniquet and put into a dry oxalated test tube: such a sample gives quite accurate results provided the different examinations be made within half an hour of its collection. Additional examinations include the red cell and leucocyte counts, the colour index, the differential and platelet counts and, in special cases, the van den Bergh reaction, sternal puncture and the determination of the size of the red blood corpuscle; the latter can be accomplished by:—(i) measuring the diameter of the erythrocyte by direct or indirect micrometry or by the halometer; the latter method, however, has not, in the author's experience, yielded reliable results and Price-Jones curves are advocated; (ii) measuring the volume of the red cell by Haden's method. Sternal puncture is a simple technical procedure and in certain cases has afforded the only clue to diagnosis. For the actual technique the reader is referred to a previous publication.

Special Gastro-Intestinal Investigations.—These include gastric analysis using the alcohol-histamine method, the glucose tolerance test,

chemical analysis of the stools for steatorrhoea and occult blood, and sigmoidoscopy. The stools should always be examined for parasitic ova and in some infections such as *S. mansoni*, Taenia and Heterophyes repeated tests often prove to be necessary. A positive cutaneous reaction in the absence of ova suggests cured or closed bilharziasis.

II.—*Helminthic Anaemias.*

A total of 762 cases of helminthic anaemia was studied applying the methods of investigation epitomized in the preceding review. The main parasitic causes of severe anaemia were *Ancylostoma duodenale* and *Schistosoma mansoni*. Urinary schistosomiasis was a cause of moderate anaemia especially if associated with haematuria or urinary sepsis, while infection with *Heterophyes heterophyes*, *Hymenolepis nana*, *Taenia saginata* and *Filaria bancrofti* were only associated with a mild degree of anaemia or normal blood counts.

Red Blood Corpuscles.—Marked hypochromia was a constant feature of the severer cases, a haemoglobin value of from 15 to 20 per cent. being common ; in two cases it was as low as 8 per cent. The number of r.b.c. was only moderately decreased so that the colour index was low ; it averaged 0·6 for the series, the highest value being 0·8 and the lowest 0·4. Microcytosis was common especially in severe chronic anaemia, while in moderate cases normocytosis was usually found : the average corpuscular diameter was 6·85 microns, the highest being 7·4 and the lowest 6·1 microns. Macrocytosis was never found. The Price-Jones curve showed a shift to the left in the chronic cases and a wide base in the normocytic group. Poikilocytosis was frequent, reticulocytosis was not marked and nucleated corpuscles were confined to heavily infected ancylostome cases of short duration ; when present they consisted of normoblasts and occasionally macro-normoblasts, but never megaloblasts. The presence of a high reticulocyte count suggested some complicating factor, such as haemorrhage, malaria, etc.

Leucocytes : a tendency to leucocytosis (11,000–12,000 per cmm.) was met with in acute ancylostome anaemia and in cases associated with pellagra. Chronic uncomplicated ancylostome anaemia showed a normal or slightly diminished total count, while in the anaemia of intestinal schistosomiasis there was a tendency to leucopenia especially if hepato-splenomegaly had supervened ; figures as low as 1,500 cells per cmm. were encountered.

The percentage of eosinophiles depended on the stage of the disease and the constitution of the patient rather than on the intensity of infection : eosinophilia was most marked in the early stages where it reached 70 to 75 per cent. in acute ancylostome cases ; it was higher in people with higher haemoglobin values. Cases showing marked eosinophilia recovered quicker on treatment, while in severe infections those with a mild eosinophilia or none at all did not do well ; this is only true however, if other signs of marrow failure are present and if infective or septic conditions are absent. An eosinophilic rise affords an index to effective therapy just as reticulocytosis does to haematinic agents.

The neutrophils were generally diminished, but a regenerative shift to the left with the Schilling's haemogram was only noted in acute cases of ancylostome anaemia associated with leucocytosis.

In very chronic cases relative lymphocytosis accompanying neutropenia was sometimes found, but monocytosis always suggested malaria.

Blood Platelets.—The platelet count was slightly diminished, averaging 175,000 per cmm.

Blood Chemistry.—The icterus-index was always within normal limits, indicating an absence of haemolysis as a causative factor in the anaemia. The total protein, estimated by Howe's method, was not uncommonly reduced, but there was no increase in urea, uric acid or non-protein nitrogen. The whole-blood cholesterol was constantly decreased, such low figures as 57 mgm. per 100 cc. being found. Hypocholesterinaemia under these circumstances is attributable to loss of red cells and haemoglobin and is not characteristic of any special type of anaemia ; it is more parallel to the haemoglobin reduction than to the oligocythaemia. The chloride content of the whole blood was increased in most cases, while the calcium content of the serum was variable ; no relationship was found between the degree of eosinophilia and the serum calcium.

Clinical Manifestations.—Investigation showed that intestinal worms, especially ancylostomes and schistosomes, could produce disturbances of gastric secretion, only 158 out of 564 cases showing normal curves, while a return toward normal was observed after expulsion of the worms in the 92 cases studied from this viewpoint. These gastric disturbances might or might not produce symptoms. The hyperchlorhydric group sometimes gave rise to a clinical picture simulating duodenal ulcer, while the hypochlorhydric and achlorhydric group usually lead to anorexia and sometimes to gastrogenous diarrhoea. The frequency of mucus of gastric origin suggested gastritis as a basic factor underlying these disturbances.

Oedema : the occurrence of oedema in helminthic infections was not uncommon and 22 such cases were subjected to clinical and biochemical studies. All patients showing odema were markedly anaemic, yet there was no relationship between the occurrence of oedema and the degree of anaemia. The absence of marked albuminuria, the normal blood urea, the absence of high blood pressure and the low blood cholesterol were definitely against either a nephritic or nephrotic factor being responsible for the oedema. Hypoproteinuria was found in 11 out of 15 cases, and the fact that this was the main factor in the production of the oedema was proved by its disappearance within 10 to 15 days on protein reinforcement of the dietary, and this in the absence of all other forms of treatment.

Glossitis and Stomatitis : Glossitis occurred to some degree in 12 per cent. of patients suffering from helminthic anaemia. It was more frequent in those showing anacidity, but might occasionally be found associated with hyperchlorhydria. Not uncommonly it was encountered in intestinal bilharziasis.

Dysphagia : about 1 per cent. manifested painless upper oesophageal dysphagia, this feature being invariably accompanied by stomatitis. Achlorhydria was found in 4 out of 8 cases and in two of these splenomegaly occurred (Plummer-Vinson syndrome).

Koilonychia : Spoon-shaped nails were met with in 22 cases, i.e., about 2·5 per cent., and were mostly associated with ancylostomiasis ; twelve were achlorhydric and 5 were hypochlorhydric. Convexity of the nails up to marked clubbing was encountered in certain cases of bilharzial dysentery.

Nervous manifestations : eighteen cases with nervous stigmata mainly due to tract lesions were observed. Of these, 14 were traceable

to associated pellagra; in the remaining four signs of lateral sclerosis were demonstrated in two, and of subacute-combined-degeneration in the other two.

Finally, the author summarizes this important study by stating that the diagnostic points in the blood picture associated with helminthic infestation are those of a marked hypochromic, micronormocytic, non-haemolytic, hypoplastic anaemia with eosinophilia.

III.—*Treatment and Mechanism of Helminthic Anaemia.*

Complete expulsion of parasites did not result in improvement in the anaemia of 27 patients kept in hospital upon a low protein diet: there was an increase of only 4 per cent. in haemoglobin in 3 to 4 weeks and an average gain in red cells not exceeding 500,000 per cmm. within the same period. When placed on a well balanced diet with sufficient protein the average rise of haemoglobin in 47 patients after anthelmintic treatment was 3 per cent.

Liver Therapy: three hundred grams of raw liver by the mouth for 2 to 4 weeks daily did not produce any notable increase in the haemoglobin percentage in 33 cases: there was no specific reticulocyte response and only in a few was there an increase in erythrocytes to the extent of 500,000 per cmm. Campolon injections were similarly ineffective. Eosinophilia commonly follows the administration of liver extract in megalocytic anaemia, but this was never observed in the present series. On the other hand, an eosinophile increase followed iron therapy—a finding which suggests that the eosinophilia originates from stimulation of the bone marrow rather than in an allergic state.

Iron therapy: iron in large doses elicited a prompt improvement in the blood picture, ferrous iron as Blaud's pills (3 to 4 t.d.s.) and *Ferri et ammonii citras* (1½ to 2 grams t.d.s.) proving most efficacious in the absence of complicating factors interfering with its utilization and absorption.

Iron was found to be more effective in ancylostoma anaemia than in intestinal bilharziasis owing to the more marked and persistent gastro-intestinal lesions in the former disease. MINOT and HEATH had found that the lower the initial color index the higher the reticulocyte crises in hypochromic anaemia under iron therapy. In the present study this finding was confirmed, but it was also ascertained that the reticulocyte response was greater where the initial figures for both reticulocytes and eosinophiles were higher. The reticulocyte curve following iron therapy in the presence of parasites proved lower, more delayed and flatter with occasional fluctuations, than when iron was administered after their expulsion, while in some cases it was found that a further rise in haemoglobin occurred after the infection was eradicated. These findings suggest that the mere presence of the worms interferes to a certain extent with the utilization of iron *per os*—possibly through the formation of a toxin. Other modifying actions such as defective secretion of HCl, diarrhoea, sepsis, hypothyroidism and arteriosclerosis are considered in relation to the therapeutic effectiveness of iron.

After parasites had been eliminated and iron given the haemoglobin rose to 60 to 75 per cent. but subsequently no further rise was observed during the period of observation extending over 10 to 15 days.

In helminthic anaemia injections of iron, using the British Pharmacopoeial preparation (injectio ferri), proved incapable of raising the

haemoglobin more than 10 per cent. in 3 weeks and copper and arsenic were likewise ineffective.

Preparations like marmite and vitamin C had no effect on the reticulocyte response or haemoglobin values, a finding which was expected in view of the micro-normocytic nature of the anaemia.

The mechanism of the production of helminthic anaemia was next considered and such factors as haemorrhage which might lead to loss of iron, depletion of haematopoietic hormone or exhaustion of the bone marrow were analysed, as well as the rôle of helminthic toxin, diet and gastro-intestinal factors. Though the ancylostome is a blood sucker and occult blood is readily demonstrated in the faeces of cases of ancylostomiasis, the number of worms expelled after treatment was not proportionate to the degree of anaemia. Similarly, in vesical bilharziasis where the blood loss is considerably greater than the intestinal variety, the anaemia was in point of fact less intense.

Achlorhydria was found to be commonly associated with helminthic anaemia and the author concludes that, though blood loss and possibly toxins may be contributory factors, the essential and more important mechanism is nutritional deficiency resulting from deficient diet and gastro-intestinal dysfunction. The deficiency is mainly in iron although other substances such as lecithin, protein, etc., are possibly also implicated. Treatment should be directed to supplying iron in large doses and also fats and proteins to help in the construction of the haemoglobin molecule.

IV.—*Rarity of Addisonian Anaemia in Egyptians.*

In a series of 1,128 hospital cases with anaemia not a single instance of Addisonian anaemia was encountered. After reviewing recent advances in knowledge concerning the production of pernicious anaemia in terms of extrinsic, intrinsic and haematopoietic factors the author considers the various conditions which may be responsible for its absence in Egypt. Race is known to exert an influence as illustrated by the low frequency of Addisonian anaemia amongst Italians, Russians, Jews and North American negroes. Again, a constitutional tendency is marked as Friedländer showed, since the disease mainly occurred in individuals with fair complexions, light hair, blue eyes and achlorhydria. A familial incidence was quite common and relatives of patients suffering from pernicious anaemia often themselves presented constitutional achylia which was a predisposing factor. Constitutional achylia was not encountered in a series of 187 healthy Egyptian children under 10 years of age, whereas acquired achylia secondary to helminthic anaemia, gastritis and pellagra frequently occurred, but never with Addisonian anaemia, a finding which suggested that an intrinsic factor must be present despite the achylia. Using Singer's method for demonstrating the intrinsic factor in gastric juice the author showed this to be the case ; a positive R.R.R. reaction in white rats was obtained in 5 chronic pellagra patients and 2 cases of helminthic anaemia. Climate also might be responsible. Thus, Addisonian anaemia was known to be common in temperate zones and rare in tropical countries. Was it possible that the sun's rays by increasing skin pigmentation produced a constitutional condition unsuitable for the development of this disease ?

The author concludes that racial and constitutional factors probably underlie the extreme rarity of Addisonian anaemia in Egypt.

N. Hamilton Fairley.

SALAH (M.). **The Types of Splenomegaly in Egypt and their Diagnosis.** —*Jl. Egyptian Med. Assoc.* 1935. Apr. Vol. 18. No. 4. pp. 255–266.

The author's account of splenomegaly in Egypt [which is not the same as Egyptian splenomegaly] is comprehensive, but from the point of view of diagnosis in life savours rather of the academic than the practical. His classification is on pathological lines and rightly so, but, though it includes every known lesion, is too subdivided for practical purposes.

The causes as a basis for diagnosis are divided into 5 groups with subdivisions: *viz.*, I. Simple Hypertrophy. II. Lymphoid Tissue lesions, including lymphocytic leukaemia, lymphosarcoma and fibroadenia. III. Reticulo-endotheliosis, subdivided into 3 main types with several subtypes. IV. Vascular lesions: Fibro-siderosis, thrombophlebitic, congestive and angiomatous. V. Hepatolienal diseases with more than a dozen subdivisions. The last is, the author states, "the most vague and unfortunately the most common in Egypt." He divides these into two main groups, according as the spleen or liver is primarily enlarged. It rather adds to the confusion to include, for example, hydatid of liver since "this is not associated with enlarged spleen unless a similar condition affects the latter," and Gaucher's disease which has not yet been recorded in Egypt.

The endemic splenomegaly of Egypt belongs to Group V and "is primarily a liver disease of bilharzial cirrhotic (mostly hypertrophic) nature, the splenic enlargement is one of its frequent manifestations." Analysis of 500 cases has led the author to the following conclusions: "(1) In no case of Egyptian splenomegaly confirmed . . . was the liver free from disease." (2) "Many more case of bilharzial liver disease are met with without enlarged spleens." (3) In every case of splenomegaly without evidence of liver implications a cause for this condition other than bilharziasis could be elicited. *H. H. S.*

MENON (T. Bhaskara) & ANNAMALAI (D. R.). **The Incidence of Hepatic Cirrhosis in South India.**—*Indian Jl. Med. Res.* 1935. Apr. Vol. 22. No. 4. pp. 827–835. [10 refs.]

The authors analyse mortality returns and hospital admissions in Madras and show that the incidence of hepatic cirrhosis is much higher than in Europe, that it has no special association with alcoholism and that the portal type is the most common. They suggest that there is a special association between portal cirrhosis and bacillary dysentery.

Figures are quoted to show that the incidence of hepatic cirrhosis is high in Bengal (ROGERS, this *Bulletin*, 1925, Vol. 22, pp. 957–61) and in Java (SNIJDERS, *l.c.*, 1934, Vol. 31, p. 330). The authors have analysed the Annual Report of the Health Officer of the Corporation of Madras, the hospital admission register and post-mortem figures. A table gives the annual figures of the Report as regards cirrhosis for 1923–1932 and shows that the average mortality per 100,000 in that period was 32·6, whereas that of England and Wales in a similar series of years was 4·7, showing that judging from mortality figures this disease is 7 times as common in Madras.

The register of admissions to the Government Rayapuram Hospital, Madras, shows 183 cases of cirrhosis in the last 3 years out of 30,817.

All but 6 were of the portal type. Of the 177, 92 per cent. were in Hindus, but 77 per cent. of the total admissions were of this race.

A study of the sex distribution shows that only 43 were in women. The greatest frequency is between 30 and 50 years.

From autopsy figures for Madras we get 4·39 per cent. cirrhosis in 1,115 autopsies, a slightly lower figure than that of ROGERS for Bengal.

As to causation there is no special relation to alcoholism.

"One of us (B.M.) carried out an analysis of autopsy records in the Madras Medical College, while working in the pathology department in 1928. The results, which are now published for the first time, show that out of 119 cases of portal cirrhosis, 45 showed definite inflammatory lesions in the large intestine. These lesions could be classified into old pigmented scars, small haemorrhagic ulcers, superficial ulceration with extensive congestion, extensive superficial ulceration involving large tracts of mucosa, large deep ulcers with necrotic base, etc. . . . Out of these 119 cases, the intestines were not examined in three cases, so that the percentage works out as 38·87 of hepatic cirrhosis, showing dysenteric lesions. Out of these 45 cases showing dysenteric lesions, in 32 cases the lesions resembled those met with in acute and subacute bacillary dysentery. They were either superficial ulcers with extreme congestion, capillary haemorrhages or small follicular ulcers surrounded by zones of congestion or extensive superficial ulceration involving large tracts of mucosa. The remaining 13 cases showed frank amoebic ulceration or healed pigmented scars. A comparison of these figures with the proportion of dysenteric lesions, met with in hospital autopsies in general, is of interest. Out of 368 recent autopsies in the Government Rayapuram Hospital, Madras, dysenteric lesions were found in 59 cases or 16·30 per cent. It seems, therefore, that there is some evidence for a positive association between dysenteric lesions in the intestines and portal cirrhosis."

Three cases of capsular cirrhosis were associated with malaria.

A. G. Bagshawe.

MCGUIRE (Christie). **Ulcers in the Tea-Gardens.**—16 pp. With 15 plates. [12 refs.] 1934. Calcutta. Published by the Indian Tea Association.

The object of this research into the aetiology and treatment of ulcers in tea-gardens was to introduce a standard treatment. The author has been 9 years at the study, first at the Calcutta School of Tropical Medicine and then in the Dooars.

He classifies the ulcers thus :—

"1. *Tropical Phagedaenic Ulcer*, due to the fusiform bacillus of Plaut.

"2. *Actinomycotic ulcers*, due to actinomyces keratolytica (Acton and McGuire) which I shall describe under the heading of Actinomycosis Cutis [see this *Bulletin*, 1930, Vol. 27, p. 523 ; 1932, Vol. 29, p. 273].

"3. *Hookworm ulcers*, due to the entrance of hookworm larvae into the skin, a condition first reported by Bentley (1902).

"4. *Streptococcal and staphylococcal ulcers* producing the lesions Impetigo and Ecthyma."

Tropical phagedaenic ulcer.—ACTON and PANJA showed that this ulcer "is caused by the fusiform bacillus," the spirochaete being a secondary invader. The author has found this bacillus in the 2,000 cases he has examined ; they form a dense felted layer beneath the slough, which secures the needful anaerobiosis. In treatment the

slough must be removed and for this a soluble caustic is needed. The best is copper sulphate. His formula is :—

" R/Copper sulphate	...	3 drachms
Acid carbolic ...	...	1 drachm
Distilled water	...	1 ounce."

" The copper sulphate must first be powdered in a mortar and thoroughly mixed with the distilled water until every bit of the copper sulphate has gone into solution. There must be no deposit. The carbolic acid is then added. As the carbolic acid rises to the top of the solution when it is left standing, it must be shaken before use on each case so as to mix the carbolic with the copper sulphate. This is very necessary as the solution is then rendered practically painless and the ulcer can now be swabbed thoroughly."

The ulcer is swabbed twice daily with the solution and as much slough as possible removed. A powder of iodoform 1 part and bismuth subgallate 3 parts is then dusted over the ulcer which is covered with a piece of dry lint and bandaged. If iodoform causes a skin eruption calomel is substituted and bismuth subnitrate may be used in the place of the subgallate. This treatment leads to cure in about 14 days, and the labourer can resume work after 7. He finds that trauma followed by impetigo plays an important part in the spread of these ulcers and advises the application of Ung. Hydrarg. Ammon. (gr.x to ʒi) to any cut or abrasion. The infective organism is almost certainly spread by the fly, *Siphonella funicola.*

Actinomycosis cutis.—This condition described by ACTON and the author is limited to the skin and does not invade the deeper tissues nor produce granules. It corresponds to Ulcus interdigitale and Keratoma plantare sulcatum of CASTELLANI and the lesions are usually found between the toes and on the soles. They are known in the tea gardens as pani-ghao (water sore).

Actinomycosis cutis interdigitalis occurs with the first onset of the rains and is seen in Ceylon and the Philippines as well as India. The causative agent *Actinomyces keratolytica* can only be seen by a special technique of staining which is described. The colouring agent is Toluidin blue which stains mycelia without staining keratin. The ulcer produced is very painful. The treatment, which is almost specific, consists in painting the lesions with a 2 per cent. solution of gentian violet in distilled water. Crowds flock round the dispensary clamouring for this treatment.

Actinomycosis cutis plantaris is a pitted condition of the heel and tread of the foot. It is very painful and is caused by the same fungus. The treatment, which again is specific, consists in painting 20 per cent. formalin on the soles once a day.

Hookworm ulcers.—These also are known as pani-ghao. The author says that one can see linear track marks showing the entrance of hookworm larvae. The labourers do not come for treatment till the vesicles have become infected. The vesicles are usually seen on the sides of the feet and instep. In the early stage application of 2 per cent. gentian violet is effective. If an inflammatory condition or ulcers are present lint soaked in acriflavine applied 3 times daily is advised.

Impetigo and ecthyma.—For these conditions, which are prevalent among the European staff the author advises Ung. hydrarg. ammon. in uncomplicated cases and acriflavine lotion when the lesions are eczematous.

A. G. B.

HOUSSIAU (F.) & DU SOLEIL (G.). Des plaies infectées chez les noirs aux mines de Kilo. Du phagédénisme vrai et faux. [**True and False Phagedaenic Ulcer in the Black Miners of Kilo.**]—*Ann. Soc. Belge de Méd. Trop.* 1935. Mar. 31. Vol. 15. No. 1. pp. 85–98. With 11 figs.

The true phagedaenic or tropical ulcer is regarded as an ulcer due to the association of the fusiform bacillus with the spirillum of Vincent. In the region of Kilo, however, this association was rather rare and the ulcers, even of phagedaenic type, contained a very varied microbian flora, in which the fuso-spirillar association was absent. Such ulcers have then to be designated " false " phagedaenic ulcers. Staphylococci predominate among the organisms found and streptococci are rare. No anaerobic cultivation was done and nothing can therefore be said of anaerobes. In the view of the authors the " true " phagedaenic ulcer is secondary to an infection produced by other organisms. They have used a number of different vaccines in the treatment of the ulcers and have come finally to one composed of 24 strains of isolated organisms plus fuso-spirillar ulcer material. This has been treated with iodine and with formol and the mixture is regarded as containing " anatoxin." The results have been decidedly successful and the time to healing much reduced ; only a few ulcers have failed to clear up under the treatment. The importance of saving of unemployed time for a worker in the mines is very evident. *W. F. Harvey.*

i. DE LANGEN (C. D.). **Clinical Arteriosclerosis in Java.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1935. Vol. 24. No. 1. pp. 1–8.

ii. MÜLLER (H.) & FOSSEN (A.). Die Altersveränderungen der Arterien bei Malaien und auf Java lebenden Chinesen.—*Ibid.* pp. 9–26. With 7 figs. on 2 plates. [20 refs.]

i. The author gives the following " conclusions and deductions " :—

" 1. Arteriosclerotic vascular changes are at least as common in Java as in Europe. If the relative age-grouping of the patients is taken into consideration, the impression is gained that these vascular changes are even more common here.

" 2. Amongst the Javanese people of lower class the clinical picture of angina pectoris is not met with, but it is seen much more often amongst those of better standing. The same is observed amongst the Chinese patients but not quite so clearly. And yet sclerotic changes in the coronary vessels are very common in our native hospital patients.

" 3. The occurrence of hypertension as a clinical picture parallels angina pectoris. Here, too, is found the paradox of much arteriosclerotic and but little hypertension among the great masses of the people, a relationship which changes with natives of better standing.

" 4. Hemiplegia is very common here, but syphilis is the predominating cause.

" 5. Thrombosis and emboli practically never occur.

" 6. Thrombo-angiitis obliterans is regularly met with in the Netherlands Indies."

These conclusions may be supplemented. The author draws attention to the difficulties of the investigation : *e.g.*, persons with severe vascular changes may have no symptoms and therefore not come under observation. The average age of the patients was much lower than that in European hospitals ; and the number of old persons small. Of patients seen in the author's department 88 per cent. were between 15 and 45, 9 per cent. between 45 and 65 and only 3 per cent. above 65.

Under the heading, general sclerotic changes in the vessels, the author notes in the younger age-groups that the radial, brachial or femoral arteries were frequently markedly tortuous, not having hard or tense walls but being soft and relaxed, and the blood pressure low rather than high. Under sclerosis of the coronary vessels he notes that whereas in 5 years' hospital practice only one native patient was treated in the wards, in his own practice (regents, native doctors, etc.) there were 12 cases of angina pectoris. He discusses the reason of the rarity of thrombosis and embolism in Javans, and is inclined to attribute it to the vegetarian diet and a lowered irritability of the vegetative nervous system. The current belief that diet, and especially the lipoid and cholesterin content, is responsible for arteriosclerosis which consequently spares the natives he contests ; he rather inclines to the view that a diet poor in fats may lead to nutritional disturbances in the vessel walls and a loss of normal elasticity.

Lastly he reports data collected by Dr. KOUWENAAR in Medan. Careful observations were made of the sclerotic changes in the vascular system of 41 autopsied subjects, 22 Javanese and 19 Chinese. Only 5 had no sclerotic changes, and in 8 instances they are described as severe. The majority of the lesions were found in the aorta, and the coronary vessels came second.

ii. The authors give the following summary— :

"A survey has been made on the changes of the arteries in ageing of one hundred and two Javanese and sixty-three Chinese, ranging from birth up to the age of seventy, taking into consideration the modifications of the inner and medium layers of the arteries, the appearance of the so-called chromotropic or mucoid substance and the features usually ascribed to arteriosclerosis. No difference can be found between Europeans living in Europe and America, and the above mentioned races. Accurate statistics about the occurrence of the different alterations of the arteries cannot be given, because we have no knowledge of the exact age of the inhabitants of this country." *A. G. B.*

DELANOË (E.) Maladie de Buerger chez une femme arabe. Essai d'interprétation de la pathogénie de cette maladie, son traitement. [**Buerger's Disease in an Arab Woman. Its Pathology and Treatment.**]—*Bull. Soc. Path. Exot.* 1935. June 12. Vol. 28. No. 6. pp. 460–464.

Buerger's disease, or thrombo-angiitis obliterans, is said to affect male Jews. The patient in this instance was a female Arab. After treatment, which is described, she recovered. *A. G. B.*

SCOTT (H. Harold). **Tuberculosis in Man in the Tropics.**—*Proc. Roy. Soc. Med.* 1935. Aug. Vol. 28. No. 10. pp. 1343–1351 (Sect. Trop. Dis. & Parasit. pp. 61–69). [Summary appears also in *Bulletin of Hygiene.*]

In discussing this subject the author draws upon his experience of making post-mortem examinations on man in the West Indies and in Hong Kong, and on animals at the London Zoological Gardens. Three types of tuberculosis are recognized, *viz.*, (1) natural, occurring in completely unprotected adults, in infants and very young children and in other primates, (2) a chronic " modified " found in races long exposed to infection, and (3) an intermediate or " larval " form.

The author next considers the two main portals of entry, *i.e.*, primary intestinal and primary lung involvement, citing autopsy records as

examples. In the case of the primary intestinal infection bacilli pass to the mesenteric glands, then spread either by (*a*) the inferior vena cava to the right side of the heart and so to the lungs, or (*b*) through lumbar and inguinal glands to the falciform ligament. In the case of primary lung infection bacilli may pass (*a*) to mediastinal glands, pulmonary circulation by way of veins, generalization again in the lungs, thence to systemic circulation to lodge in spleen, liver and kidneys, or (*b*) by swallowed sputum to intestine, thence to mesenteric glands and by direct continuity to lumbar and inguinal glands and thence to falciform ligament. Difficulties arise, however, in the case of New World monkeys owing to the fact that they have no thoracic duct.

A summary is given of previous work by Professor BEATTIE and the author showing that two distinct forms of acute tuberculosis are to be found both in man and in other primates, *viz.*, [*a*] a respiratory type with a rapidly fatal infection causing death by general dissemination of bacilli by the lymphatics and the blood vessels, and [*b*] a primary alimentary form, less rapidly fatal. Alimentary tuberculosis may also be secondary to primary respiratory infection, the disease being transmitted to the intestines by the swallowing of large numbers of bacilli. In each type of disease the dissemination of infection to the lymphatic system takes place in the same order in monkeys as in man, and the proportion of alimentary tuberculosis to respiratory is probably much the same in all primates. Respiratory tuberculosis is identical in young human subjects and in other primates but in later life in the former a modifying factor comes into play. Tuberculosis in early human life is the " natural " form of the disease. In other primates the modifying factor is absent and the adults are affected in the same way as the young animals.

The author considers that the only congenital infection with *Myco. tuberculosis* is by way of a tuberculous placenta. He cites a case related elsewhere of a baby 22 days old dying with a caseated focus in one lung, another 24 days old with a caseous focus in one lung and grey tubercles disseminated through both, and a third, aged 7 weeks, with extensive involvement of both lungs. SCHLUSTER is also cited as having collected 12 cases of tuberculosis at birth.

An analysis of the sex distribution of 300 cases of tuberculosis in natives (Hong Kong) gives 155 males and 145 females, but the preponderance was entirely in those over 20 years of age. Up to 10 years males were to females as 4 to 5, between 10 and 20 years they were equal, and over 20 years the ratio was 3·6 to 1. In China, at least, this does not imply that the incidence is necessarily so much higher in males, the preponderance of males being probably due to the fact that females more readily go home to die and are unrecorded.

Comparing his autopsy figures on the Chinese children with those of Canti, Ghon, Albrecht and others on European children, the author points out that the presence of tuberculous mediastinal glands is not invariably an indication of a pulmonary focus. Amongst 225 autopsies on children detailed in his previously published report it did not hold good in 13 per cent., *i.e.*, caseous tracheo-bronchial glands were present but no focus was discovered in the lungs. Furthermore, it is not invariably true that tuberculous mediastinal glands when present bear a close relation to the focus in the lung. Again, when a focus was present in the lung, tuberculous mediastinal glands were not constantly found. In the author's experience fibroid or healed foci were rarely seen in children. Instances of peculiar and unexplainable association of sites

of lesion are also cited. Thus, 12 instances were met with of limitation of the disease to the lung and to the meninges. In another case there were two mediastinal glands infected but no other lesion, but miliary tubercles were present in the meninges. Lastly, a case is cited of abdominal tuberculosis with tubercles in the meninges and no other lesions. In these 300 Hong Kong cases there was a much greater preponderance of tuberculous meningitis amongst adults than amongst children—1 out of every 5 adults with chronic pulmonary tuberculosis showed miliary tubercles in the meninges without signs in the other viscera. Finally, no cases of haemoptysis were recorded in the group of 225 children.

Discussing the severity of pulmonary tuberculosis amongst natives in the tropics the author does not think that virgin soil will explain the prevalence. Mode of life, habits or change of habits, industrialization, overcrowding, general bad sanitation, early marriage, frequent pregnancies, prolonged lactation, poor food, want of exercise and all the rest, must be taken into account. Dealing with the introduction of the tubercle bacillus into native countries by infected Europeans, the author concludes that "every consumptive person expectorating the tubercle bacillus is to be regarded as a public menace and, to the negro, a very real menace. Tropical conditions are not always good for the phthisical European. He can, it is true, be more in the open air, but the tuberculous subject is easily fatigued; he avoids the tropical sun, his rooms are shaded to keep them cool, he suffers from loss of sleep, his appetite is capricious and his food less nutritious than at home. Even were it not so, is it not, to put it very mildly, a little selfish to introduce open tuberculous cases among unprotected or even partly protected natives?"

S. Roodhouse Gloyne.

PFLOMM (Erich). Operationsvorbereitungen in den Subtropen. [**Pre-Operation Precautionary Measures in Subtropical Regions.**]—*Muench. Med. Woch.* 1935. Apr. 25. Vol. 82. No. 17. pp. 661–662.

The region in question is South China. Here the natives stand operations, particularly abdominal operations, badly; the chief conditions to bear in mind are syphilis, beriberi and clonorchiasis.

Beriberi is widely distributed and in its early stages may give little evidence of its presence. In the last two years the author has administered to every operation patient whether there was suspicion of beriberi or not, large doses of cardiazol, thus eliminating beriberi shock. In cases in which immediate operation was necessary cardiazol was injected once or more in the course of it.

In Kwangtung clonorchis infection is found in 16 to 100 per cent. of people, according to district, in seamen and fishermen in 49 and 100 per cent. respectively. The eggs must be looked for in the stools in every case. Many fatal results especially in abdominal operations must be put down to this worm. Treatment is by spirozid or neosalvarsan; latterly, following on the work of OTTO, gold injections have been used, and among these the author prefers solganol B oleosum, every 4–5 days in increasing doses. If there is not time for preliminary treatment liver preparations, such as campolon and hepatrat, are injected to reinforce the disturbed liver function.

A. G. B.

REVIEWS AND NOTICES.

BLACKLOCK (D. B.) [M.D. (Edin.), D.P.H. (London), D.T.M. (Liver.)] & SOUTHWELL (T.) [D.Sc., Ph.D., A.R.C.Sc., F.Z.S., F.R.S.E.]. **A Guide to Human Parasitology for Medical Practitioners.** Second Edition.—pp. viii + 259. With 2 coloured plates & 122 text figs. 1935. London: H. K. Lewis & Co., Ltd. [12*s*. 6*d*.]

When reviewing for this *Bulletin* the first edition of Blacklock and Southwell's little book, the writer expressed the opinion that it represented " a successful attempt to meet what he has long recognized as a very urgent need—a small concise text-book suitable for students commencing a study of Parasitology, and particularly for those who are taking the course of instruction prescribed for the Diplomas of Tropical Medicine and Public Health." The fact that the first edition has been exhausted so quickly is a very satisfactory demonstration that teachers and students have agreed with the reviewer.

As the original edition was so excellent, it is not surprising that the new one contains but few changes. In their introduction the authors state that in revising the book they have taken advantage of the critical suggestions which have appeared in various reviews of the first edition, and that they have now omitted some matter not essential and some which proved incapable of adequate treatment in an elementary book of this nature. This has resulted in the deletion of the matter relating to *Dipylidium* and of the half dozen pages devoted to drugs used in the treatment of parasitic diseases. A number of clerical and minor errors which had crept into the earlier edition have been rectified and the index has been improved.

Two features of the new edition appear to the reviewer to be so unusual as to merit particular notice and special commendation. The authors have not merely successfully resisted the almost overriding temptation to increase the size of the volume, they have actually succeeded in reducing it by twelve pages; and the publishers while maintaining the same high standard of printing and finish have managed to reduce the price from 15*s*. to 12*s*. These facts suggest that the authors and publishers are determined to produce eventually something which will surely be unique, *viz*. a wholly satisfactory elementary text-book at a price which even the impecunious student will regard with favour. They have our best wishes in their pursuit of this unattainable ideal. *W. Yorke.*

Manson's Tropical Diseases. A Manual of the Diseases of Warm Climates.—Edited by Philip H. MANSON-BAHR, D.S.O., M.A., M.D., D.T.M. & H. Cantab., F.R.C.P. Lond., Physician to the Hospital for Tropical Diseases, London, etc. Tenth Edition. Revised.—pp. xx + 1093. With 22 colour plates, 15 half-tone plates, 381 figures in the text, 6 maps & 38 charts. 1935. London, Toronto, Melbourne & Sydney: Cassell & Co., Ltd. [31*s*. 6*d*.]

A new edition of so widely-known a manual as *Manson* is best reviewed by making some comparison of the new issue with its immediate predecessor. In spite of the enormous mass of new matter which the Editor has had to cope with, the bulk of the volume is but little increased, space for the records of the notable advances

in knowledge having been provided by sacrificing some of the less practical material in the domain of medical zoology, but even then sufficient is left to make the section most helpful for reference or for rapid revision. In the Editor's remodelled classification of disease, a new group appears—Diseases caused by Filterable Viruses. This comprises Yellow Fever, Rift Valley Fever, Psittacosis, Rabies, Dengue, Phlebotomus Fever, and the Pock Diseases, and is prefaced by an admirable preliminary discussion on the nature and characters of the infective viruses ; while the material in the body of the section is presented in a clear and balanced fashion that testifies to the burden of toil incurred in tracing and collating a multitude of writings on every aspect of the virus diseases. The enquiring reader will turn with curiosity to the chapter on the typhus group of fevers. This difficult and complex family, which is subjected to the continual flux and stress of shifting opinion, is handled with clarity and common sense, and the Editor, like Sir Walter's Davie Deans in matters ecclesiastical, is scrupulous in avoiding right-hand snares and extremes, and left-hand way-slidings.

Everywhere throughout the book there is evidence of diligence and care in bringing the subject matter up to date, and another feature which requires special mention is the expanded account of methods of treatment wherever medicaments of specific value are available. Like the foregoing edition, the tenth is liberally illustrated by plates, text-figures, maps and charts ; a goodly number of the coloured plates are from the Editor's hand and show that he is as ready with the brush as with the pen.

The reviewer noticed only a single *lapsus calami*—and that one which involves himself. He is quoted (p. 251) as employing the masculine form of a Latin adjective with a noun which is feminine in gender ! But even this most unkindest cut does not affect his opinion that the new edition of *Manson* is a worthy representative of the high traditions of its long line. *W. P. MacArthur.*

DE LANGEN (C. D.) [Professor of Medicine in the Medical School of the University in Batavia, Java] & LICHTENSTEIN (A.) [Formerly Lecturer in the Military Course in Tropical Diseases in Batavia, at Present Established in Amsterdam]. **A Clinical Text-Book of Tropical Medicine.** Done into English by Dr. A. H. HAMILTON, B.A. (Cantab.) ; M.D. (Penn.) ; L.M.B.D. First English Edition from the Revised Third Dutch Edition.—pp. 557+xxxv. With 39 plates & 12 figs. 1936. Batavia-C-Surabaya—Amsterdam : G. Kolff & Co. [27*s*.]

By those who are able to read Dutch this book has been spoken of as " one of the best, perhaps the best " of text-books on Diseases of Warm Climates. Now English readers have the opportunity of testing and confirming, modifying or reversing that verdict. As with all works covering a wide field, there must be inequality in the thoroughness with which the different aspects are treated, for no two authors can be expected to be fully cognizant of the most recent developments in multifarious conditions comprised under tropical medicine.

On the whole it is a very good book, but in saying this we must bear in mind that it purports to be a *clinical* text-book ; it does not cover—it does not profess to cover—the larger expanse of ground such as is

included in, say, Manson's Tropical Diseases. Incidentally, it is curious to note that the most recent edition of the latter bears date 1935, and appeared in November, whereas the third Dutch edition of de Langen and Lichtenstein is dated January 1933, the introduction to the English translation dated 1934, the book appeared in November 1935, but is dated 1936.

The work begins with a graphic opening description of malaria, the discovery of the parasite and proof of its being the aetiological factor. In half a page the reader is put in possession of the important facts and the parts played respectively by MANSON, by ROSS, by GRASSI and by MACCALLUM. In some points the information is well up-to-date, unexpectedly so when we remember what time often elapses between the reception of the manuscript by the printer and the issue of the completed book. Thus we find the mention of the Schüffner dots in quartan malaria and a description of the clinical symptoms associated with infection by *Plasmodium ovale*. On the other hand there are omissions which cannot be ascribed to the translation being from a work appearing less than three years ago. For example, the account of *Chagas's disease* is poor; the Triatoma is the only vector mentioned and the goitrous condition associated is taken for granted as aetiologically connected with the infection. Under *Leishmaniasis* no mention is made of all the work of ADLER. As regards *Yaws* the authors are, apparently, dualists, but, though there is a passing reference to yaws and syphilis (p. 113) there is no discussion of a vexed point. Perhaps the authors did not consider this necessary in a "clinical" work. MEGAW's grouping of tropical typhus is adopted, but nothing is said of the relative importance of the two types of Malayan typhus, the "bush" and "shop" types. Under *yellow fever*, monkey infection is noted, but no reference to mice and the importance of the protection test in mice, nor a single word regarding FINDLAY's work on this and on immunity (though HINDLE's vaccine has a line). Six species of mosquitoes, in addition to *Aëdes aegypti*, it is said "may also transmit the infection to a greater or less extent," but there is nothing to indicate that infection of these is experimental in the laboratory and is not proved to occur in nature. A good general account is given of *Leprosy*, but nothing on the leprous reaction and its treatment—a clinical matter of some importance. "Climatological buboes" are transiently referred to under *plague*, but no reference has been found to lymphogranuloma inguinale and climatic bubo. Is it quite correct now to say *Br. abortus* and *Br. melitensis* "cannot be differentiated in the laboratory . . . either by cultural, serological or animal tests"? Too little is made of the importance of typhoid carriers in the tropics; their danger cannot be lightly dismissed in the words "Such an investigation is of but little practical significance because in any event there will constantly be new infections coming in from the native villages." Among the bacillary dysenteries the Sonne form is not mentioned; phage is spoken of under dysentery but nothing is said of it under plague, in which its use is even more *sub judice*, and d'HERELLE is given all the credit of bacteriophage introduction, TWORT is not even referred to. The importance of Monilia in *sprue* aetiology is overrated in accordance with modern views, but the points against it being causative are not considered. Further, in a clinical text-book one would expect at least a reference to FAIRLEY's researches and the results of his treatment based thereon. *Pellagra* is considered, but not the many "pellagroid" conditions.

The Helminthological sections are very unequal. Clayton LANE has not even the honour of mention in that of hookworm infestation. The following seems a little puzzling: "Blood is always absent [from the faeces] both macroscopically and microscopically; its presence indicates a complicating dysentery. In the very severe stages mild haemorrhages may take place from the gut." Two pages later: "That chronic loss of blood from the intestinal tract occurs is certain." Onchocercosis is dismissed in 10 lines, and no mention is made of ocular symptoms; Dracunculus has 3 lines, Sparganosis almost a page.

Sunstroke is dealt with in 12 lines, and heatstroke is ignored; poisonous snakes have a page, and poisonous fish a few lines more, lead poisoning practically the same. Vegetal poisons are not considered, with one exception, jenkol (*Pithecolobium geminum*).

The Index needs revision, Christophers is spelt with two 'f's, Christopherson is mentioned in the text but not in the index, Fairley becomes an adverb and Shute is spelt Shule both in text and index, but to the general reader these are negligible points so long as their views are correctly rendered.

It would not be fair to end on a carping note. Some of the chapters have been already issued as *separate* and have received special abstracts, *e.g.*, PALTHE's on Psychiatry and Neurology in the Tropics; Vos's article on Skin Cancer in Natives of the Netherlands East Indies which has been incorporated in the Cancer section [see *Bulletin of Hygiene*, 1935, Vol. 10, p. 387]; the chapter on Geographical Pathology [*ante*, p. 71] and the tables of analyses of Foodstuffs. Other points to which favourable attention may be specially drawn are: the table differentiating malarial and quinine amblyopia (p. 28); the graphic representation of the developmental stages of Strongyloides; the coloured plate demonstrating a mode of estimating the beriberi preventing power of different forms of rice; there is a good summary of Acclimatisation.

In conclusion the printing is good, clear and well-spaced, the illustrations apposite and the coloured plates exceptionally well reproduced and the work will doubtless find a much wider public now that it has been translated, for the translating has been so well done that the English reader will rarely suspect that the work was not originally written in that language. *H. H. S.*

PERLA (David) [M.D.] & MARMORSTON (Jessie) [M.D.]. **The Spleen and Resistance.** With a Foreword by David MARINE, M.D.—pp. xi + 170. 1935. London: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, W.C. 2. [9*s*.]

The study opens with a brief account of the comparative anatomy and histology of the spleen. Its development is noted, and the current nomenclature of its principal cells.

After summarizing the histological changes which occur in acute infections, descriptions, largely taken from the literature, follow of appearances encountered over a wide range of bacterial, virus and other infections.

The spleen is next considered as an organ of macrophage tissue. Its importance in the mechanism of resistance is inferred from a

review of the abundant evidence of the phagocytic capacity of macrophage cells for all types of particulate matter, and also from their behaviour towards sensitized particles.

In reviewing the literature bearing on the spleen's function in antibody formation, the authors note the definite evidence of fixation of antigen by the spleen, and that in most cases splenectomy has been found to depress antibody formation.

On the question of the spleen as a site of antibody formation, the relative concentrations of antibody in various organs is discussed in some detail, although little note seems to have been taken of reports on splenic tissue culture experiments.

The second half of the study is concerned to a greater extent with observations based on the authors' researches. Splenectomy in certain animal species is shown to depress natural resistance to both acute and chronic infections. Several conditions are cited to show that experimental splenectomy may be followed by a breakdown of an acquired resistance with consequent lighting up of a latent infection. Compensating changes following splenectomy are described in the common experimental animals, and remarks are made on such evidence as is available in corresponding human pathology.

Evidence from experimental splenic transplants in rats suggests that the mechanism of resistance to anaemia of *Bartonella muris* infection depends on the presence of splenic red pulp ; *i.e.*, on free and fixed reticular cells. Absence of nerve supply to such transplants is noted.

The authors describe the preparation of an ether extract of ox spleen with which they had some success in protecting splenectomized rats from the anaemia of *Bartonella muris* infection. The metabolism of copper is discussed and the spleen suggested as of importance in this connexion rather than in the metabolism of iron, as previously accepted.

A chapter is devoted to some of the reasons for the wide discrepancies in existing experimental records, such as variation in relative size of the spleen in different species, variations in amount of extra-splenic " splenoid " tissue, differences associated with the age and sex of experimental animals.

References are copious throughout the book—witness the bibliography of more than 450 entries. Subject and author indexes complete an extensive study. *P. H. Martin.*

SENEVET (G.) [Professeur à la Faculté de Médecine d'Alger, Chef de Laboratoire à l'Institut Pasteur d'Algérie]. **Les anophèles de la France et de ses colonies. 1re partie. France, Corse, Afrique, Madagascar, La Réunion. Encyclopédie Entomologique. Série A, XIX.** [Anopheles of France and the French Colonies, Part I.] —361 pp. With 146 figs. & 35 plates. 1935. Paris VIe : Paul Lechevalier, Editeur, 12, rue de Tournon. [95 francs.]

The book is designed to give precise information about the *Anopheles* which occur in France and her overseas possessions, and should be of great value to the members of French Colonial Medical Services. It is planned to appear in several volumes.

The first volume, which is the subject of the present review, opens with a short account of methods of collecting and breeding *Anopheles* ; this is followed by a few pages on the external anatomy designed to assist the man who wishes to identify specimens. The author

then passes to an account of the species known or likely to be discovered in France, Corsica, the French possessions in Africa, Madagascar and Réunion. The area under consideration is therefore heterogeneous, the majority of the species of *Anopheles* having African affinities, but a considerable proportion of them being members of the Palaearctic fauna. The bulk of the work deals with the species in alphabetical order, which is perhaps to be regretted because the African and Palaearctic forms are mixed with one another; moreover, closely related species such as the members of the *marshalli* group are widely separated in the alphabetical sequence. The treatment of each species is full and apparently up-to-date. The author sets out the anatomical characters of the adult and of the early stages; the geographical distribution, showing the actual localities from which specimens have been recorded in a series of maps which are not very perfectly reproduced; the breeding places and habits of the adult; and the importance of the species as a transmitter of malaria.

To the British reader the book will be valuable partly because it gives an up-to-date *résumé* of what is known, and because the author has so carefully collected available information about the distinctive characteristics in the early stages. The local lists which may be found at the end of the volume are also of great value, for they tell one immediately whether a certain species of *Anopheles* has been recorded from Madagascar, the Ivory Coast or some other French possession: names of species likely to occur in the particular area are added.

We anticipate that the book will be almost as much appreciated in British possessions as in French. *P. A. Buxton.*

ROCKEFELLER FOUNDATION. **Annual Report 1934** [MASON (Max), President].—pp. xiv + 408. With 17 figs. (1 map) on 11 plates. New York: 49 West 49th Street.

Although the President of the Rockefeller Foundation refers, in the preface to the Annual Report for 1934, to the difficulty in deciding upon the allotment of funds "when increased opportunity and need coincide with diminished resources," there seems to have been little or no diminution during the year in the amount of work carried on with the help, and under the auspices, of the Foundation. As in former years, there was active research in the field on yellow fever, malaria, hookworm disease, undulant fever, yaws, tuberculosis, diphtheria and other diseases. Much help was given to promote the training of men and women in public health work, and a large number of fellowships were granted. The branch of medicine specially selected for support was that dealing with derangements and diseases of the nervous system; and considerable financial aid was given for the endowment, or establishment, of special departments in existing institutions, for research in mental diseases.

In that part of the report referring to the International Health Division, many matters of interest are recorded. Considerable progress has been made in the study of the epidemiology of yellow fever, and the tests for acquired immunity to the disease have confirmed the opinion, expressed in the report for 1933, that a mild form is widely prevalent among both white and black races. The recognition of what is called "Jungle Yellow Fever" is of great importance. Four outbreaks of yellow fever occurred in Brazil, Bolivia and Colombia. in none of which Stegomyia (*Aëdes aegypti*) mosquitoes were found,

In April 1934, "an unusually rapid and fatal form" was present not far from Cuyaba, the Capital of Matto Grosso, Brazil, in an area where Stegomyia does not occur: so far, the carrier in these epidemics has not been identified. The fact of the absence of the mosquito in these cases does not, of course, lessen the importance of Stegomyia as the vector of yellow fever in urban and other districts, but it certainly indicates that the problem of yellow fever requires further study.

The control of malaria in Italy is dealt with at some length. The introduction of the small fish, *Gambusia*, led to very successful results; in one small area in Istria, where the only antimalarial measure employed was stocking with this fish, malaria has practically disappeared. In some other districts good results were obtained by the treatment of mosquito breeding sites with Paris Green.

In the field of Natural Science, the Foundation, in accordance with its general policy of concentration on fewer subjects, selected that of experimental biology. Space does not allow even for the bare enumeration of all the subjects of medical interest, to the furtherance of which help was given; among them were heredity and genetics, endocrinology, and the physiology of respiration and reproduction.

A map of Europe (excluding Soviet Russia) is given in the report, showing the places where the Foundation is engaged, or is giving assistance, in public health work; practically every country in the continent is included.

As in former years, this Report is a record of excellent work well planned and well carried out. It shows how much good can be done when knowledge and the means to utilize it are combined with sympathetic and able administration. *H. J. Walton.*

ROCKEFELLER FOUNDATION. **International Health Division. Annual Report 1934.**—235 pp. With 22 figs. on 12 plates. New York: 49 West 49th Street.

The benefactions of the Rockefeller Foundation are so many, so great and so varied that no review can do them justice. In the Foundation's Annual Report about 60 pages are given to an account of the work of the International Health Division; the separate report concerning the activities of this Division is a book of over 200 pages and even in it little actual detail is included. In the following brief review some of these activities are indicated.

Until the beginning of the present century *yellow fever* was a constant source of dread in the west, and a grave menace, especially in seaports and to shipping. Since that time, owing to work in great part instigated, inspired and financed by the Foundation, so much has been accomplished that yellow fever no longer occupies the chief place in the minds of health officers of American continents. Details are given of the campaigns against this infection in Havana, Panama, Rio de Janeiro, Guayaquil and elsewhere and much has been learned from research after the discovery that monkeys and mice were susceptible and that the danger for workers might be reduced almost to vanishing point by serum-virus inoculation.

Fresh ground has been broken in the discovery of a new rural type of yellow fever which can occur in absence of *Aëdes aegypti*, in places where the land has been incompletely cleared of forest and jungle and in isolated spots. Its mode of transmission in these circumstances has

yet to be determined. Other research has been directed to improving the method of vaccination, and work is being prosecuted in laboratories in New York City, in Rio de Janeiro, and in the Institut Pasteur, Paris.

Much also is being attempted and a good deal accomplished in investigation of and research into *malaria*. There is the Malarial Experimental Station in Italy, under Professor Missiroli in Rome, and small laboratories are established elsewhere. Work of a preventive and control character, by drainage, by engineering measures and by field experiment in many parts of the world is in progress—in Albania, Bulgaria, Greece, Spain, Spain, Portugal; in Colombia, Panama, Costa Rica, Porto Rico, Jamaica, the Virgin Islands, the Philippines.

By field study five varieties of *A. maculipennis* in addition to the type *A. maculipennis*, Meigen, have been found in Europe, *viz.*: *messeae*, Fallerini, *melanoon*, Hackett, *atroparvus*, van Thiel, *labranchiae*, Falleroni, and *elutus*, Edwards. Further new drugs in treatment are being tested, the experimental work being first carried out on avian malaria.

Nations infested by *hookworm* again claim a large share of the benefactions of the Rockefeller Foundation. Re-surveys have been undertaken in the southern United States; soil sanitation is being taken in hand, especially in Egypt, control measures in Samoa and the South Pacific Islands and elsewhere and research into the relations and connexion between defective nutrition and hookworm anaemia.

Special mention must be made of *yaws* control in Jamaica and the study incriminating *Hippelates pallipes* as the most likely vector in the island [see this *Bulletin*, 1935, Vol. 32, p. 885 and Suppl. p. 233*]. The extensive campaign for treatment of the disease in Western Samoa must not be forgotten [*Ibid.*, 1934, Vol. 31, Suppl. p. 165*].

Tuberculosis investigations are being pursued in the West Indies, and in the United States, in rural Michigan, in Tennessee, and the question of control in Panama and Porto Rico. Mention of other diseases in which study is being carried on should not be omitted, such as diphtheria, Rocky Mountain fever and undulant fever.

Apart from all this the Foundation gives aid to State and Local Health Services in Tennessee, in Quebec, in the United Provinces (India), in China and in Java. It has also divisions of Vital Statistics and Epidemiology, and it supports many Public Health laboratories, and nursing and education and schools of Hygiene. Whether the Rockefeller Foundation has or has not a motto, it certainly is a firm believer that *nullus argento color est, nisi temperato splendeat usu* and thereby effects the greatest good to the greatest number. *H. H. S.*

LONGMANS' AFRICAN HYGIENE PICTURES. **No. 1. Water. No. 2. Flies. No. 3. Mosquitoes. No. 4. Worms and Disease.** [Size 22½ × 30 ins.; 2s. the set.] **How to use the Hygiene Pictures. A Teachers' Handbook.**—15 pp. [6d.] 1935. London: Longmans, Green & Co. Ltd.

These publications consist of four black-and-white wall pictures for use as subjects of hygiene lessons in African schools, and a leaflet giving practical suggestions to teachers on how the pictures can best be used in class teaching. Each picture gives several scenes of African life illustrating the lesson it is designed to teach. Thus the first picture shows a water supply being fouled by cattle, and by human beings washing themselves or their dirty clothes in it, or using the bank as a latrine, and brings home to the African children the important lesson

that the village water supply must be kept clean by enclosure or other means, and that drinking water should be boiled. The second picture shows how flies carry disease and how they may be got rid of, or at least prevented from doing harm, by keeping the house clean, burning rubbish, covering foodstuffs, and other such measures. The third picture illustrates the life-history and breeding places of the two common disease-bearing mosquitoes, anopheles as carrier of malaria and culex as carrier of filaria, and shows how they may be controlled by cutting the grass and clearing the bush round the houses, and by clearing up old tins and swampy ground and putting kerosene on the top of water in tanks. The fourth picture, which is perhaps the most difficult of the series for children to understand, is entitled "Worms and disease." It shows the life-history of the tapeworm, guineaworm, bilharzia and hook-worm, and sums up methods of prevention in the words "Boil your drinking water. Cook your food thoroughly. Wash uncooked vegetables. Build a pit-latrine and use it." *R. L. S.*

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